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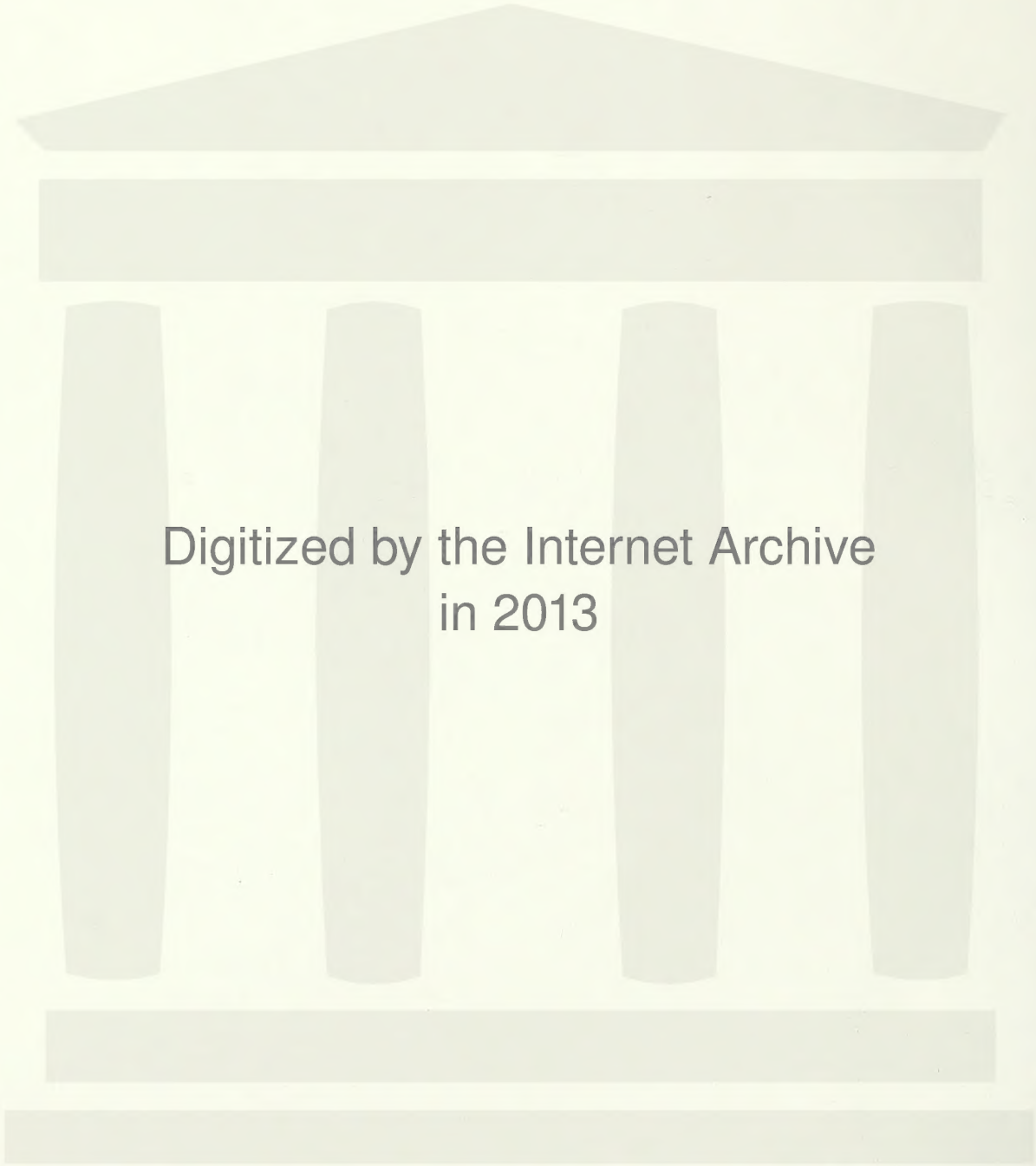
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SEPTEMBER 1996

CALTRAIN SAN FRANCISCO
DOWNTOWN EXTENSION PROJECT
CONCEPTUAL DESIGN AND DRAFT EIS/EIR

Preliminary Capital Cost Estimates

PENINSULA CORRIDOR JOINT POWERS BOARD

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CAPITAL COST ESTIMATES

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PREPARED BY

ICF KAISER ENGINEERS, INC

September 16, 1996

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CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT
ESTIMATE CRITERIA
FOR THE
PRELIMINARY CAPITAL COST ESTIMATES
FOR
TRANSBAY TERMINAL SITE ALTERNATIVES

The Peninsula Corridor Joint Powers Board (JPB) has contracted with ICF Kaiser Engineers, Inc. to provide consulting services for the preparation of conceptual engineering studies and plans, cost estimates, and an Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) for the extension of CalTrain to a new downtown San Francisco terminal. These ***Preliminary Capital Cost Estimates*** are the third and final in a series of three capital cost estimates prepared for this study phase. The initial estimates for this project were the ***Rough Order-of-Magnitude (ROM) Capital Cost Estimates*** issued in August 1995. The second round of estimates issued for this project were the ***Design Options Screening Capital Cost Estimates*** issued in October 1995.

This estimate generally relies on the updated ***Capital Cost Methodology Report*** issued on January 18, 1996. Exceptions are explained in this ***Estimate Criteria.***

PURPOSE

These cost estimates are prepared to assist in the evaluation and selection of final design options for the ***CalTrain San Francisco Downtown Extension Project***.

The ***Design Options Screening Report*** issued September 26, 1995 considered two major alternatives with several design options. A primary issue was the selection of the **best site** for the downtown CalTrain terminal and a sub-issue was the specific location, configuration and general arrangement of the terminal station. Five different station sites and configurations were estimated. An additional critical issue was the selection of the optimum extension alignments and underground construction methods (tunneling or cut-and-cover). A further issue was whether or not the existing CalTrain diesel locomotives could be retrofitted for safe and healthy operation in an underground subway and passenger station environment. As an alternative to the latter, the feasibility of converting the existing diesel locomotives to liquefied natural gas (LNG) was evaluated. As a third choice for train propulsion, full electrification of the entire 78-mile line from San Francisco to Gilroy was evaluated. As a fourth choice, the use of dual mode (diesel and electric) locomotives was reviewed.

These issues listed above were analyzed and discussed in detail and various decisions resulted. These ***Preliminary Capital Cost Estimates*** are an update of the *Screening Capital*

Cost Estimates for the alternatives and design options which remain under consideration for implementation by the Joint Powers Board.

SCOPE

The scope of these estimates is to evaluate the capital costs of the identified alternatives/design options for providing an approximate 1.3-mile underground extension of the CalTrain commuter rail line from the existing outlying terminal at Fourth and Townsend Streets directly into downtown San Francisco.

In this estimate various CalTrain extension design options are being evaluated. These design options may be grouped in the following categories;

1. Route profile and alignment options along Seventh Street and Townsend Street to Third and Townsend (3), two of which contain an at grade Mission Bay Station.
2. Curved tunnel alignment options (3) from Third and Townsend to just north of Folsom and Essex Streets.
3. Transbay bus terminal replacement location and configuration options (4), which have secondary impacts on the CalTrain terminal rail facility construction and cost.
4. CalTrain satellite storage yard location options (2), with further variation to be compatible with the alternative route profiles and alignments along Seventh Street and Townsend Street to Third and Townsend (preceding Item 1).
5. Locomotive propulsion options (3).

Common segments of the various alternatives/design options were identified with a cost estimate prepared for each segment. Immediately following this criteria is a project map which shows the location of the various alignment segments. These alignment segments plus the systemwide segments, "SW" 's, have been arranged in different combinations to form the Base Case Alternative.

Table 1 (next page) identifies the items which are both included and excluded in the Base Case Alternative capital cost estimate. Nine other alternatives were also estimated consisting of the Base Case Alternative modified as appropriate for each specific design option. Appendix A contains the following tables which further define the segments and the alignment options:

1. ***Segment Composition of Alternatives*** which lists the segments comprising each alternative.
2. ***Segment Definition Table*** which defines the limits of the segments.
3. ***Alignment Schedule*** which shows the limits by construction type and method along the various alignments.

TABLE 1 - DEFINITION OF BASE CASE ALTERNATIVE CAPITAL COST ESTIMATE

Items Included	Design Option Included
1. Townsend Street Segment	Townsend -South Side (Portal @ Fourth, surface station in Mission Bay)
2. Mined Tunnel Segment	Short- Radius/Long mined tunnel under Colin P. Kelly & Essex Streets.
3. Folsom Street to Transbay Terminal Segment	Cut-and-cover 6 -track terminal under existing Transbay Terminal site, w/ terminal foundations / columns capable of supporting mid-rise development above train terminal.
4. Satellite Storage Yard	16th & Owens site. 8- 1000' long storage tracks plus maintenance buildings
5. Locomotive Propulsion	23 new dual mode locomotives minus a credit for 23 new diesel-electric loco's; 1500-Volt DC electrification from new terminal to 23rd Street (3.2 miles)
6. Additional Rail Passenger Cars	15 additional stainless steel gallery cars.
7. Additional Peninsula Park & Ride Lot Spaces.	1,888 additional Park & Ride lot spaces at 13 Peninsula stations
8. R/W Acquisition & Relocation	All privately owned R/W (except for Catellus R/W) needed for implementing the project plus relocation of businesses
9. Engineering, Construction Management , and Project Administration (Owner's Costs).	An amount equal to ~21 % of all construction, procurement and R/W acquisition costs (Items 1 thru 8 above).
10. Contingency Allowance	An amount equal to ~19.5 % of all construction, procurement, R/W acquisition costs and Engg,CM & Proj Admn.(Items 1 thru 9 above).
11. Project Reserve	An amount equal to ~7.5 % of all costs noted above (Items 1 thru 10) for potential additions to the currently identified scope of work .
Items Excluded	
1. Demolition and Replacement of the Transbay Terminal	Options range from about $68 million to $164 million; CCSF is pursuing as a separate but related project.
2. Underground Pedestrian Concourse Beneath Beale Street from Transbay Terminal Site to Market Street / BART / MUNI Metro.	Option would cost $36 million to include.
3. Diesel-Electric Locomotive Replacements (23)	The costs to replace the current fleet of locomotives (~$94 million) at the end of their useful lives (2005-2010 time frame) is considered to be a capital replacement cost under the "No Build" Alternative.
4. Public R/W and Catellus R/W	Costs for public R/W, primarily Caltrans TBT R/W and easements under City streets were not included because they are already transportation R/W's in public ownership.
5. Pre-Operating or Start-up Expenses for Training, Pre-Revenue Testing	Not included .
6. Escalation for Future Year Construction	Not included here in capital cost estimates. Assumed to be ~3.5% per year in the financial analysis presented elsewhere.

PROJECT DEFINITION DOCUMENTS

The ***Revised /Final Capital Cost Methodology Report*** dated January 1996, documents the methodology and the guideline unit costs used to prepare the capital cost estimates of the various project design options. It also lists various project definition documents available at the time of preparation of that document.

Since that time, additional engineering and architectural documentation has been prepared. To meet the demanding project schedule, draft and markup drawings have been used for estimate preparation in advance of completion of the formal project drawings. Subsurface geotechnical conditions have been investigated in considerable detail for this project. In particular, the ***Geotechnical Engineering Recommendations Report*** issued December 27, 1995 has been relied on to a considerable extent in cost estimate preparation. The Underground Construction Board of Consultants report on geotechnical conditions, dated September 27, 1995, provided guidance on construction methods and subsurface construction details. More recently the ***Tunnel Engineering Analysis and Cost Report*** issued on June 14, 1996, provided additional specific guidance on tunneling and underpinning methods and costs.

Utility relocation is described in the Draft Report - ***Utilities Inventory and Relocation/Reinforcement Report - Downtown Station Relocation DEIS/DEIR***, August 29, 1995. The estimate contained herein is an edited version of the one contained in subject report.

Additional definition has been provided through written instructions and oral discussions. In addition, various assumptions have been made by the estimating team.

ESTIMATE FORMAT

The estimate is presented using ICF KE's proprietary software ***ALTEST*** developed for use in preparing capital cost estimates for the analyses of multiple alternatives[1]. The estimates for rail facilities is prepared in segments and summarized into the Baseline Alternative estimate plus nine other alternative estimates each representing a specific design option. The alternatives/options are summarized and compared on the ***Alternative Comparison*** sheets.

In turn, these numbers are further condensed to a master summary labeled ***Capital Cost Estimates.*** This master summary also includes the cost for the Transbay Bus Terminal and ramp replacement facilities associated with each option. The cost of these bus terminal replacement facilities was developed using the ***Transbay Area Plan Project Study (TAPPS)***

plus additional design development by the Kaiser-DeLeuw team. See **Discussion** section of this criteria.

The segments comprising each alternative are listed in the ***Segment Composition of Alternatives*** in Appendix A. Items priced in the segments are termed ***"work elements"***. For the more important typical trackway sections and stations, detailed pricing by standard account is summarized into ***"typical costs"***. Many of the typical costs were developed for the ***Capital Cost Methodology Report***. Since that time, the tunneling costs have been refined by the studies supporting the ***Tunnel Engineering Analysis and Cost Report.*** In particular see the tunneling report prepared by Haley and Aldrich dated April, 1996; the report ***Ground Treatment and Support Feasibility Study*** by Nicholson Construction dated April 1996; and the report ***Underpinning of Existing Historic Buildings*** by Werner and Associates dated May 1996. In addition, other subsequent changes have been made, particularly for station and terminal cost. Where pricing has changed from the January 1996 ***Capital Cost Methodology Report,*** the most recent version of the typical costs is included in this estimate under the appropriate work element category. The developed unit cost is transferred to the appropriate segment estimate as a ***"work element"***. The pricing is further discussed in the pricing section of this criteria.

The major categories of work elements estimated are: site modifications, trackway, stations, trackwork, traction power, signaling, communications, yards and shops, rolling stock, and park-and-ride lots (expansion of existing lots). Traction power, signaling, communications, yards and shops, and rolling stock are estimated in "systemwide" segments. The systemwide segments are segments not attributed to any particular geographic area.

Right-of-way, Engineering and Management, Contingency, and Project Reserve are termed "add-ons" and added below the line. Escalation is not included at this time.

QUANTITIES

System quantities were taken off the plan-and-profile drawings by segment. Detailed quantity takeoffs were made using the typical section sketches, with allowances made for items not shown. A quantity summary indicating the route-feet(RF) and track-feet(TF) quantities for each segment has been prepared. See ***Segment Definition Table*** in Appendix A for the summary data.

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1. This system was developed more than ten years ago by Kaiser Engineers. During this time period, it has proven its worth on numerous UMTA and FTA Alternatives Analyses and MIS studies of major transit investments.

PRICING

Pricing of all work elements includes labor and burden; construction equipment usage; material; permanent equipment; and contractor's overhead and profit. Mid-1995 craft rates applicable to San Francisco were used. Local San Francisco prices were obtained for selected materials. Vendor quotations were obtained for certain equipment items. Sales tax at 8 ½ % is included on all materials and equipment.

Using this pricing information, typical costs were developed for the typical sections of trackway and selected additional items. Detailed takeoff and pricing was prepared for three of the four underground CalTrain terminal design options; the other two were estimated by adjusting the two detailed estimates. Segment 5A, for the design with a high rise structure over the CalTrain terminal, and Segment 5B, for the design with a the ***Transbay Short*** bus terminal over the CalTrain terminal, are the design concepts where full details of the estimate are included in this estimate package.

Where sufficient definition was not available, allowances for such items as dewatering have been made based on experience on similar projects. Factors have been applied on the segment summary sheets where appropriate to reflect non-typical site-specific conditions. For trackway, the major work element for this project, a table has been prepared to calculate the "factor" considering multiple cost impacts simultaneously.

Pricing for the electric locomotive options and gallery cars for the passenger trains was developed from review of recent orders for several passenger rail authorities on both the east and west coasts.

RIGHT-OF-WAY & RELOCATION

No cost has been included for above or below ground easements on the Catellus property in Mission Bay where the JPB currently possesses a permanent easement to operate commuter passenger trains. It has been assumed that CALTRANS and City of San Francisco property which is already dedicated to transportation uses (city streets, TBT site) may be utilized at no cost to the project.

The CALTRANS right-of- way utilized generally consists of the Transbay Terminal site and supporting bus ramp areas. The City of San Francisco right-of-way generally consists of easements beneath city streets.

Relocation costs for impacted businesses have been included. No residential relocations are required.

ENGINEERING AND MANAGEMENT

Engineering and management has been determined on a percentage of construction cost basis. Generally 25% has been used. However, smaller percentages have been used for acquiring new passenger rail cars, locomotives and right-of-way. See tables in the ***Add-on*** section. Included is engineering and construction management by a general engineering consultant (GEC); and project management and administration by the JPB or their agents.

CONTINGENCY

Contingency is an allowance to cover design development, uncertain market conditions at the time of bids, and recognizes the approximate estimating methods used. Contingency ***does not*** cover changes to the currently identified scope of work. Contingency has been evaluated on a percentage basis by individual work element. The percentage varies from 10% to 30%. See tables in the ***Add-on*** section.

ESCALATION AND SCHEDULE

This estimate is prepared in **July 1995 dollars**. Escalation to the time of expenditure is estimated to be about 3.5% per year but has not been added here. Escalation to the mid-point of construction is included in the capital cost financing plan, however, which appears elsewhere.

PROJECT RESERVE

Project reserve is an account established to cover unexpected changes/additions in the work scope and unanticipated costs that occur during construction, particularly construction change orders and claims. It is set at 8% on all items, except for passenger railcar and locomotive purchase where 3% has been used. See tables in the ***Add-on*** section.

COST EXCLUSIONS

Costs of the following items are excluded from this estimate:

1. Any work at the existing or proposed JPB primary maintenance facilities other than track electrification and the associated requirements for the design option with electrified track to Gilroy.
2. Trackway, signaling or other upgrades for the existing system other than those specifically listed in the estimate.
3. Right-of-way purchase cost for property to be utilized which is owned by CALTRANS, the City of San Francisco, and Catellus property in Mission Bay where a permanent easement in favor of the JPB already exists.

4. Pre-operating "start-up" expenses.
5. Escalation.

ESTIMATE DISCUSSION

In general, it is assumed that design of the various facilities will be similar to that of other systems of comparable size and function, and that standard construction and contracting practices will apply.

1. **Hazardous Materials:** Removal and offsite disposal of identified hazardous materials has been included under the cost category "Environmental Mitigations". Two sites with contaminants were identified in the ***Screening Capital Cost Estimates***. See memorandum of September 15, 1995 by Mark Filippini of Dames and Moore. This memo as well as the current estimates are behind the ***Street, Railroad, Structure Modifications, Underpinning and Mitigations*** tab. Relevant to this estimate are the coal tar discharges from a turn-of-the century power plant located near Fremont and Howard Streets. Note that the estimate is based on an out-of-state disposal fee of $85/cubic yard (CY).

2. **Utilities:** A survey of existing utilities was the basis of most of the utility costs; other utilities were priced on a rough allowance basis. Utilities intersecting subway construction will be supported in place or relocated as necessary. All longitudinal utilities within the guideway construction envelope will be relocated. Overhead electric utilities, if any, that interfere will be raised by installing taller poles. Utility relocation is assumed to be scheduled well in advance of the trackway and station construction.

3. **Railroad Modifications:** Segments 1A, 1B, 1C (for Options A, B & C), the corresponding Sixteenth Street Yard Estimates and the Townsend Street Yard all include allowances of $500,000 for modifications to the existing Southern (Now Union) Pacific railroad facilities. A "before", "after" and staging track layout of the non-project track is needed to more accurately assess the required cost to modify these facilities.

4. **Rock Tunneling:** Significant attention has been focused on the design and the construction methods for the proposed rock tunnels. The Board of Consultants, in their deliberations, during and subsequent to their meetings of July 6, 1995 and September 14, 1995, expressed significant concerns as to the risks involved in rock tunneling in the poor quality rock found along the alignments. In response to this concern, a conservative multiple drift rock excavation scheme for the rock tunnels was estimated for the ***Screening Capital Cost Estimates***.

   The tunneling costs for this estimate have been further refined. In the reports previously mentioned, Haley and Aldrich estimated three additional methods of tunnel construction. This estimate is based on the single bore, double track tunnel with

longitudinal spiling, which method is considered to be adequately prudent and conservative. The present estimate should not be considered definitive as to the relative cost of these alternative construction techniques. Additional subsurface investigation and design will be necessary before it can definitely be determined which tunneling technique will be the least costly to construct while still maintaining acceptable levels of risk.

5. **Rail Salvage:** All rail for the ballasted track for new mainline at grade track construction is assumed to be salvaged from the existing mainline track. New rail has been assumed for yard track construction because the new yard tracks would have to be built first before the existing yard tracks are taken up. All direct fixation trackwork is priced assuming purchase of new 136 lb/yd continuous welded rail (CWR).

6. **Electrification/Propulsion:** The baseline alternative is based on the use of new dual mode (diesel and electric) locomotives with 1500 Volt DC electrification from the new downtown terminal to two miles beyond the new subway portal (~ 3.3 miles). One design option is the use of ***Electric Power Trailers*** in tandem with diesel locomotives. This choice would utilize 25 KV AC electrification, and like the baseline, is electrified from the new downtown terminal to two miles beyond the new subway portal. It is assumed that new diesel locomotives will be required for this option, as the existing locomotive fleet will be nearing the end of its useful life by the time the downtown extension is completed and opened to revenue service (2005-2010). A third design option estimated is 25 KV AC electrification for the full 78-mile system to Gilroy. New electric locomotives will be required.

For all propulsion options, a credit is shown for the purchase of 23 new diesel locomotives, as the present locomotives will be 20-25 years old in the 2005-2010 time frame and will have to be replaced regardless of whether the downtown extension is implemented or not.

It is assumed that vertical clearances in the four existing CalTrain tunnels in San Francisco will be adequate for the electrified options so that it will not be necessary to raise the roof of the tunnels or to lower the track. For traction power and overhead catenary systems, the following items have been included in the estimate as allowances:

- Relocation/protection of existing utilities .
- Corrosion protection for the DC system.
- Power factor correction and harmonic filtering costs
- PG&E fees to deliver power to the traction power substations
- Modification to existing train signalling system to make it compatible with electrification, with the rail serving as the path for the return current.

- Additions to the communications system (SCADA) in order to remotely monitor and control the substations and tie-breaker stations.

For the full electrification option, the OCS work in segments 3, 4 & 5 (along the existing alignment) may have to be performed at night and on weekends to avoid conflicts with the train schedules. This would necessitate premium wages and lost time to mobilize and demobilize for the time windows available. The additional cost associated with this is included in the estimate.

7. **Locomotive Resale:** Allowance has not been included for the resale of the surplus diesel locomotives, as it is assumed that they will be at the end of their useful lives by the time the downtown extension opens.

8. **New Transbay Bus Terminal Facilities:** Estimates for the new Transbay Bus Terminal facilities are included for each of the four bus terminal replacement alternatives under consideration. These estimates were prepared separate from the rail facility estimates and appear behind separate dividers. A difference with the rail facilities estimates is that each bus terminal replacement estimate is developed complete with "site modifications", etc. These estimates were prepared using the ***Transbay Terminal Decision Report*** and the separate cost estimates supporting that report. This work is a part of the ***Transbay Area Plan Project (TAPPS)*** by Parsons Brinckerhoff(PB). The PB cost estimates were refined using the construction staging plans and other additional design development information by the Kaiser-DeLeuw team.

9. **Environmentally Sensitive Cut-and-Cover:** In this estimate, *Environmentally Sensitive* Cut-and-Cover has been allowed for by increasing cut-and-cover line construction cost by a factor of 1.05 where applicable. This is to include improved quality street and sidewalk decking and time-of-day access restrictions on the contractor for both the Townsend Street segment and the Folsom Street- to-Transbay Terminal site segment.

ESTIMATE COMPARISON AND OPTION COST

Tables 2 (located towards the end of this tab section) shows a cost summary of the Base Case and Table 3 through 7 (included in the next tab section) show a comparison between the four Alternative Options and the Base Case.

Townsend Street Alignment Options - Table 4 compares Options A, B and C along Townsend Street. Also included in this comparison is Alternative 2BT which uses the Townsend Street Yard. Options A & B are very close (separated by about $1 million). Option C with the extended subway costs about $111.5 million over the Base Case which is Option B. Alternative 2BT, the Townsend Street Yard Alternative, is about $2.5 million cheaper than the 16th Street Yard Alternative. Although this scheme has more track footage, it is less costly because there is not the need to demolish the large existing warehouse building north of 16th Street or modify the planned MUNI Metro East LRT yard facility south of 16th Street.

Mined Tunnel Alignment Options - Table 5 compares the three mined tunnel alignments from Third and Townsend to near Bryant Street. The three options are within about $5 million of each other, with the long radius, short tunnel being the cheapest and the short radius, long tunnel, being the most expensive. The cost differences are primarily a result of the length of tunnel; the long curve having the shortest overall length of tunnel.

Locomotive Propulsion Options - Table 6 compares the three electrification propulsion schemes. The dual mode DC system is selected as the Base Case concept. The dual mode AC concept, while cheaper to electrify, costs about $79 million additional because of the need to buy new diesel locomotives in addition to the electric power trailers. Alternative 5C, the full AC electrification concept, costs roughly $144 million more than the Base Case concept because of the cost to electrify the entire 78-mile system to Gilroy.

Rail Facility Cost - Table 7 compares the rail facility cost corresponding to the selected bus terminal replacement option. The three options are within about $6.4 million of each other, with the lowest cost associated with the Transbay Short Bus Terminal and the highest cost associated with the separate Main Beale Bus Terminal. Additional surface facilities and amenities are planned at the Transbay Terminal site when it is developed without an overlying bus facility.

Additional Options - Two options have been evaluated that are not included in the alternative summaries. Segment 5PS, included with the segment estimates, is a complete estimate of the cost to construct a 950-foot long pedestrian subway, complete with moving sidewalks, from the new Transbay Terminal to the BART/MUNI Metro Embarcadero Station. This estimate indicates a total cost of over $36 million, the majority of the cost being in the excavation and structure cost beneath Beale Street.

Segment MBBASE, included with the Main Beale Bus Terminal estimate, is an estimate of the additional cost to construct an approximate 600-space basement parking garage beneath the Main Beale Bus Terminal. This estimate also indicates a total cost of over $36 million, the majority of the cost being in the excavation and structure cost in the poor soils at this site (Bay fill area).

APPENDICES

Additional explanatory information is included in Appendix A and Appendix B.

Appendix A includes important project definition tables as follows.

1. ***Segment Composition of Alternatives***
2. ***Segment Definition Table***
3. ***Alignment Schedule***

Appendix B includes additional reports as follows:

1. ***Capital Cost Estimate Methodology for Utility Relocation/Reinforcement***
2. ***CalTrain Downtown Extension Ventilation Study.***

Table 2

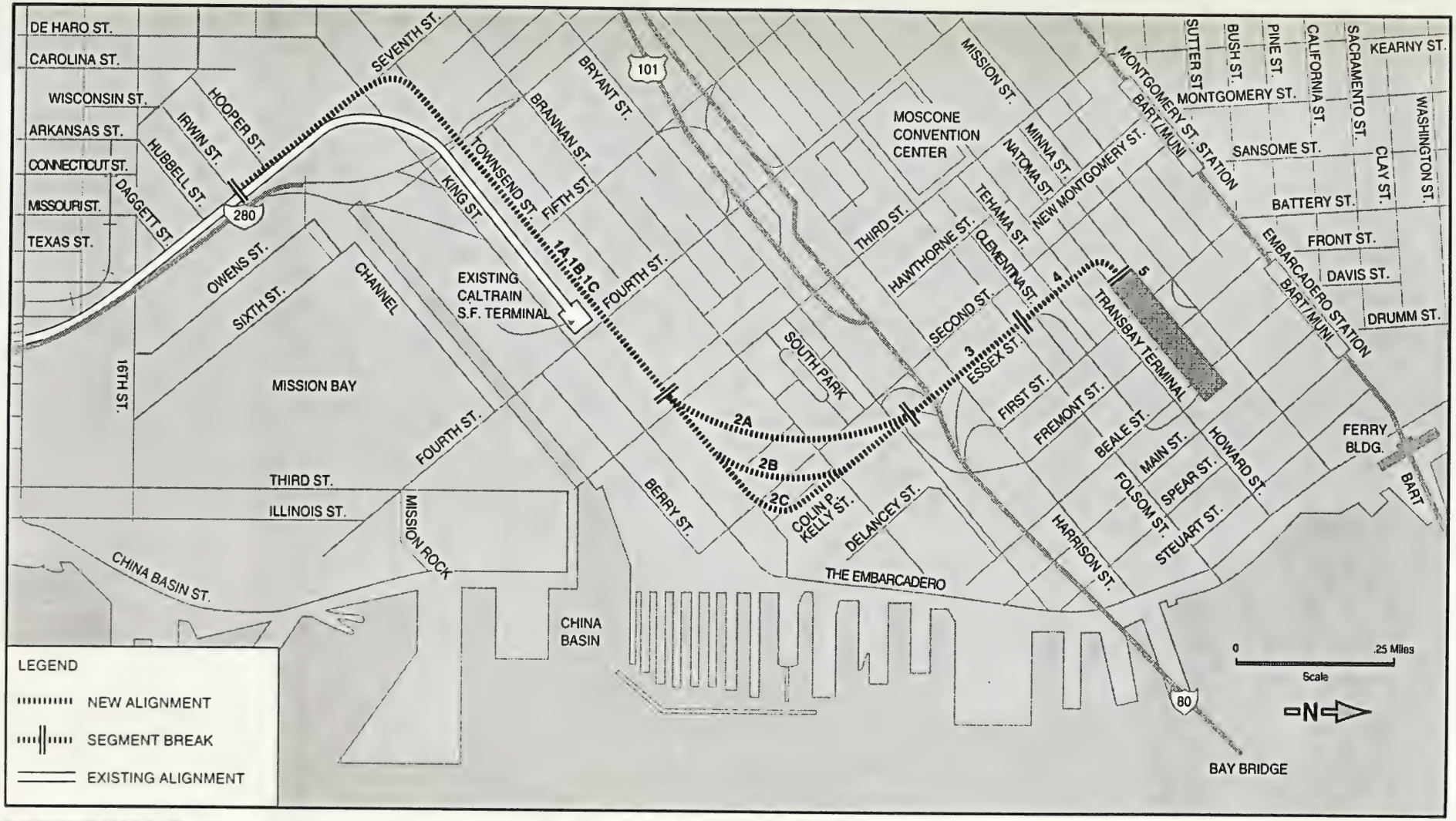
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT

PRELIMINARY CAPITAL COST ESTIMATE (Base Case)

(IN MILLIONS OF JULY 1995 DOLLARS)

1.	Right-of-Way for Extension	$ 9.18
2.	Townsend Street Segment (3,935 feet)	$ 39.27
3.	Mined Tunnel Segment (3,900 feet)	$ 86.53
4.	Folsom-Transbay Terminal Segment (990 feet)	$ 39.92
5.	6-Track Underground Terminal (1,035 feet)	$ 85.18
6.	Traction Power, Signalling & Communications	$ 19.85
7.	New Dual Mode Locomotives (23)	$101.20
8.	Additional Gallery Passenger Cars (15)	$ 27.00
9.	San Francisco Satellite Storage Yard	$ 9.94
	Sub-Total - Construction and Procurement Costs:	$418.07
10.	Engineering, CM and Project Administration	$ 74.94
11.	Contingency	$ 87.60
12.	Project Reserve	$ 40.04
	Total - San Francisco Downtown Extension Costs:	$620.65
	Less Credit for Capital Replacement Costs of 23 Diesel Locomotives (Required Regardless of Extension)*	(94.74)
	Net Total - San Francisco Downtown Extension Costs:	$525.91
13.	Park & Ride Lot Expansions at Peninsula Stations*	$ 35.50
	CALTRAIN S.F. DOWNTOWN EXTENSION TOTAL:	**$561.40**
14.	Replacement Costs for Transbay Terminal Removal, Main Beale Terminal Building Option *	$160.30

* Costs include Engineering/Admin., Contingency and Project Reserve



CALTRAIN SAN FRANCISCO
DOWNTOWN EXTENSION PROJECT

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TRANSBAY TERMINAL
RAIL ALTERNATIVES AND SEGMENTS

Downtown San Francisco

ICF KAISER/DELEUW

J96-059 Mc2

CALTRAIN DOWNTOWN EXTENSION PROJECT
PRELIMINARY ESTIMATE
MASTER SUMMARY

TABLE 3

Job : 65928
Date:9/19/96
By: K. Kalsi

CAPITAL COST ESTIMATES

COST	BASE CASE*	TOWNSEND STREET ALIGNMENT OPTIONS			ALTERNATIVE TUNNEL ALIGNMENT OPTIONS		LOCOMOTIVE PROPULSION OPTIONS		BUS REPLACEMENT OPTIONS	TERMINAL OPTIONS	
		Center Median	South Side w/T.Yd	Long Subway	Long Radius Curve	Medium Radius Curve	Dual Mode AC	Full System AC	Main - Beale Surface	Transbay Short	Transbay Medium
ELEMENTS	**BC**	**2A**	**2BT**	**2C**	**1A**	**1B**	**5B**	**5C**	**3AS**	**3B**	**3C**
CalTrain Terminal	80,148	80,446	80,148	78,657	80,148	80,148	80,148	80,148	80,148	77,733	80,020
CalTrain Extension	147,777	145,757	147,777	206,439	143,956	145,054	147,777	147,777	147,777	147,777	147,777
Site Work & Utilities	17,380	18,517	16,536	28,174	19,987	17,980	17,380	17,380	17,380	15,901	15,901
CalTrain System Elements	35,384	35,290	35,711	35,926	35,218	35,303	32,277	116,638	35,384	35,384	35,384
CalTrain Equipment Needs	47,700	47,700	47,700	47,700	47,700	47,700	119,000	56,900	47,700	47,700	47,700
Park & Ride Lot Expansion	9,674	9,674	9,674	9,674	9,674	9,674	9,674	9,674	9,674	9,674	9,674
Right-of -Way & Easements	21,872	21,872	20,872	21,872	19,747	21,847	21,872	21,872	21,872	21,872	21,872
Subtotals	359,935	359,256	358,418	428,442	356,430	357,706	428,128	450,389	359,935	356,041	358,328
Design CM, & Owner Costs	76,212	76,042	75,982	93,338	75,654	75,658	77,574	96,801	76,212	75,238	75,810
Contingency Allowance	85,876	85,807	85,382	103,527	85,098	85,352	92,657	108,194	85,876	84,828	85,400
Project Reserve	39,377	39,304	39,197	47,640	38,990	39,113	41,919	49,586	39,377	38,904	39,178
Total	**561,400**	**560,409**	**558,979**	**672,947**	**556,172**	**557,829**	**640,278**	**704,970**	**561,400**	**555,011**	**558,716**
Bus Terminal & Ramps	160,303	160,303	160,303	160,303	160,303	160,303	160,303	160,303	67,713	164,314	158,607

* See Base Case Definition presented in Table 1

CALTRAIN DOWNTOWN EXTENSION
PRELIMINARY ESTIMATE
BASE CASE vs
TOWNSEND STREET ALIGNMENT OPTIONS

Job : 65928
Date: 9/17/96
By: K. Kalsi

TABLE 4

CAPITAL COST ESTIMATES

COST ELEMENTS	BASE CASE*	TOWNSEND STREET ALIGNMENT OPTIONS		
	South Side 2B	Center Median 2A	South Side w/ T. Yard 2BT	Long Subway 2C
CalTrain Underground Terminal	80,148	80,446	80,148	78,657
CalTrain Underground Extension	147,777	145,757	147,777	206,439
Site Work & Utilities	17,380	18,517	16,536	28,174
CalTrain System Elements	35,384	35,290	35,711	35,926
CalTrain Equipment Needs	47,700	47,700	47,700	47,700
Park & Ride Lot Expansion	9,674	9,674	9,674	9,674
Right-of -Way & Easements	21,872	21,872	20,872	21,872
Subtotals	359,935	359,256	358,418	428,442
Design, CM & Owner's Costs	76,212	76,042	75,982	93,338
Contingency Allowance	85,876	85,807	85,382	103,527
Project Reserve	39,377	39,304	39,197	47,640
Total	**561,400**	**560,409**	**558,979**	**672,947**
Bus Terminal & Ramps	160,303	160,303	160,303	160,303

* See Base Case Definition presented in Table 1

CALTRAIN DOWNTOWN EXTENSION
PRELIMINARY ESTIMATE
BASE CASE vs ALTERNATIVE
MINED TUNNEL ALIGNMENT OPTIONS

Job: 65928
Date: 9/17/96
By: K.Kalsi

TABLE 5

CAPITAL COST ESTIMATES

COST ELEMENTS	BASE CASE*	ALTERNATIVE MINED TUNNEL ALIGNMENT OPTIONS	
	Short Radius Curve 1C	Long Radius Curve 1A	Medium Radius Curve 1B
CalTrain Terminal	80,148	80,148	80,148
CalTrain Extension	147,777	143,956	145,054
Site Work & Utilities	17,380	19,987	17,980
CalTrain System Elements	35,384	35,218	35,303
CalTrain Equipment Needs	47,700	47,700	47,700
Park & Ride Lot Expansion	9,674	9,674	9,674
Right-of -Way & Easements	21,872	19,747	21,847
Subtotals	359,935	356,430	357,706
Design, CM & Owner's Costs	76,212	75,654	75,658
Contingency Allowance	85,876	85,098	85,352
Project Reserve	39,377	38,990	39,113
Total	**561,400**	**556,172**	**557,829**
Bus Terminal & Ramps	160,303	160,303	160,303

* See Base Case Definition presented in Table 1

TABLE 6

CAPITAL COST ESTIMATES

COST ELEMENTS	BASE CASE*	LOCOMOTIVE PROPULSION OPTIONS	
	DUAL MODE DC 5A	DUAL MODE AC 5B	FULL SYSTEM AC 5C
CalTrain Terminal	80,148	80,148	80,148
CalTrain Extension	147,777	147,777	147,777
Site Work & Utilities	17,380	17,380	17,380
CalTrain System Elements	35,384	32,277	116,638
CalTrain Equipment Needs	47,700	119,000	56,900
Park & Ride Lot Expansion	9,674	9,674	9,674
Right-of -Way & Easements	21,872	21,872	21,872
Subtotals	359,935	428,128	450,389
Design, CM & Owner's Costs	76,212	77,574	96,801
Contingency Allowance	85,876	92,657	108,194
Project Reserve	39,377	41,919	49,586
Total	**561,400**	**640,278**	**704,970**
Bus Terminal & Ramps	160,303	160,303	160,303

* See Base Case Definition presented in Table 1.

CALTRAIN DOWNTOWN EXTENSION
PRELIMINARY ESTIMATE
BASE CASE vs
BUS TERMINAL REPLACEMENT OPTIONS
(CalTrain Extension Cost Differences)

Job: 65928
Date: 9/17/96
By: K. Kalsi

TABLE 7

CAPITAL COST ESTIMATES

COST ELEMENTS	BASE CASE*	BUS TERMINAL REPLACEMENT OPTIONS		
	MAIN- BEALE 3A	MAIN-BEALE SURFACE 3AS	TRANSBAY SHORT 3B	TRANSBAY MEDIUM 3C
CalTrain Terminal	80,148	80,148	77,733	80,020
CalTrain Extension	147,777	147,777	147,777	147,777
Site Work & Utilities	17,380	17,380	15,901	15,901
CalTrain System Elements	35,384	35,384	35,384	35,384
CalTrain Equipment Needs	47,700	47,700	47,700	47,700
Park & Ride Lot Expansion	9,674	9,674	9,674	9,674
Right-of -Way & Easements	21,872	21,872	21,872	21,872
Subtotals	359,935	359,935	356,041	358,328
Design, CM & Owner's Costs	76,212	76,212	75,238	75,810
Contingency Allowance	85,876	85,876	84,828	85,400
Project Reserve	39,377	39,377	38,904	39,178
Total	**561,400**	**561,400**	**555,011**	**558,716**
Bus Terminal & Ramps	160,303	67,713	164,314	158,607
	* See Base Case Definition presented in Table 1.			

ICF KAISER ENGINEERS

CalTrain Downtown Extension

JOB NO. 65928-005-06 REV. NO. E

09/19/96 10:44:28

BY:KSK

ALL COSTS IN $1,000'S

ALTERNATIVE COMPARISON: 1 - TOWNSEND ST OPTIONS ABC W/SATELLITE YARD CHOICE

DESCRIPTION	UNIT	ALT.: BC OPT "B" QTY	COST	ALT.: 2A OPT "A" QTY	COST	ALT.: 2C OPT "C" QTY	COST	ALT.: 2BT B+T.yd. QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA																			
ROUTE LENGTH	RF	9860	0	9900	0	10725	0	9860	0	0	0	0	0	0	0	0	0	0	0
TRACK LENGTH	TF	43050	0	43130	0	44780	0	45850	0	0	0	0	0	0	0	0	0	0	0
CONSTRUCTION COSTS																			
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	5077	2342	5117	2420	5942	2547	5076	1534	0	0	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	6111	7667	6151	8005	6976	17808	6111	7631	0	0	0	0	0	0	0	0	0	0
-STREET AND ROAD MODIFICATIONS	RF	6110	1681	6150	2393	6975	2145	6110	1681	0	0	0	0	0	0	0	0	0	0
-RAILROAD MODIFICATIONS	LS	2	1000	2	1000	2	1000	2	1000	0	0	0	0	0	0	0	0	0	0
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	2	1200	2	1200	2	1200	2	1200	0	0	0	0	0	0	0	0	0	0
-ENVIRONMENTAL MITIGATIONS	LS	3	3490	3	3499	3	3474	3	3490	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	2350	235	170	17	2310	231	0	0	0	0	0	0	0	0	0	0
TRACKWAY - RETAINED CUT	RF	660	5320	660	5320	700	5642	660	5320	0	0	0	0	0	0	0	0	0	0
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1955	58785	1955	56761	4940	117339	1955	58785	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	3900	83441	3900	83441	3900	83441	3900	83441	0	0	0	0	0	0	0	0	0	0
TERMINAL - STRUCT/FINISH	EA	1	78657	1	78657	1	78657	1	78657	0	0	0	0	0	0	0	0	0	0
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	1	1789	0	0	1	1491	0	0	0	0	0	0	0	0	0	0
TRACKWORK - BALLASTED	TF	20830	3123	20910	3133	16550	2558	23630	3557	0	0	0	0	0	0	0	0	0	0
TRACKWORK - DIRECT FIXATION	TF	22220	5112	21440	4933	28230	6494	22220	5112	0	0	0	0	0	0	0	0	0	0
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	4	2429	4	2504	4	2154	4	2280	0	0	0	0	0	0	0	0	0	0
TRACTION POWER SYSTEM (SYS WIDE)	EA	1	9830	1	9830	1	9830	1	9830	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	1	3376	1	3376	1	3376	1	3376	0	0	0	0	0	0	0	0	0	0
COMMUNICATIONS (SYSTEM WIDE)	TF	1	6639	1	6639	1	6639	1	6639	0	0	0	0	0	0	0	0	0	0
YARDS & SHOPS (SYSTEM WIDE)	EA	1	4875	1	4875	1	4875	1	4917	0	0	0	0	0	0	0	0	0	0
GALLERY CARS (SYSTEMWIDE)	EA	15	27000	15	27000	15	27000	15	27000	0	0	0	0	0	0	0	0	0	0
LOCOMOTIVES (SYSTEMWIDE)	EA	23	101200	23	101200	23	101200	23	101200	0	0	0	0	0	0	0	0	0	0
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	23	-80500	23	-80500	23	-80500	23	-80500	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	1	9674	1	9674	1	9674	1	9674	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :			$338063		$337384		$406570		$337546		$0		$0		$0		$0		$0
NON-CONSTRUCTION COSTS																			
RIGHT OF WAY & RELOCATION	EA	5	21872	5	21872	5	21872	4	20872	0	0	0	0	0	0	0	0	0	0
ENGINEERING & MANAGEMENT		0	76212	0	76042	0	93338	0	75982	0	0	0	0	0	0	0	0	0	0
Subtotal NON-CONSTRUCTION COSTS :			$98084		$97914		$115210		$96854		$0		$0		$0		$0		$0
CONTINGENCY																			
CONTINGENCY		0	85876	0	85807	0	103527	0	85382	0	0	0	0	0	0	0	0	0	0
ESCALATION																			
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																			
PROJECT RESERVE		0	39377	0	39304	0	47640	0	39197	0	0	0	0	0	0	0	0	0	0
T O T A L :			$561400		$560409		$672947		$558979		$0		$0		$0		$0		$0

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

09/19/9[illegible] 10:44:31
BY:KSK
ALL COSTS IN $1,000'S

ALTERNATIVE COMPARISON: 2 - TUNNEL ALIGNMENTS: LONG, MEDIUM & SHORT CURVES

DESCRIPTION	UNIT	ALT.: _BC SHORT QTY	COST	ALT.: 1A LONG QTY	COST	ALT.: 1B MEDIUM QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA																			
ROUTE LENGTH	RF	9860	0	9500	0	9685	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACK LENGTH	TF	43050	0	42330	0	42700	0	0	0	0	0	0	0	0	0	0	0	0	0
CONSTRUCTION COSTS																			
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	5077	2342	4987	2333	5077	2342	0	0	0	0	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	6111	7667	6021	8738	6111	7667	0	0	0	0	0	0	0	0	0	0	0	0
-STREET AND ROAD MODIFICATIONS	RF	6110	1681	6020	1726	6110	1681	0	0	0	0	0	0	0	0	0	0	0	0
-RAILROAD MODIFICATIONS	LS	2	1000	2	1000	2	1000	0	0	0	0	0	0	0	0	0	0	0	0
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	2	1200	2	2700	2	1800	0	0	0	0	0	0	0	0	0	0	0	0
-ENVIRONMENTAL MITIGATIONS	LS	3	3490	3	3490	3	3490	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	2310	231	2310	231	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - RETAINED CUT	RF	660	5320	660	5320	660	5320	0	0	0	0	0	0	0	0	0	0	0	0
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1955	58785	1955	58785	1955	58785	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	3900	83441	3540	79620	3725	80718	0	0	0	0	0	0	0	0	0	0	0	0
TERMINAL - STRUCT/FINISH	EA	1	78657	1	78657	1	78657	0	0	0	0	0	0	0	0	0	0	0	0
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	1	1491	1	1491	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWORK - BALLASTED	TF	20830	3123	20830	3123	20830	3123	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWORK - DIRECT FIXATION	TF	22220	5112	21500	4946	21870	5031	0	0	0	0	0	0	0	0	0	0	0	0
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	4	2429	4	2429	4	2429	0	0	0	0	0	0	0	0	0	0	0	0
TRACTION POWER SYSTEM (SYS WIDE)	EA	1	9830	1	9830	1	9830	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	1	3376	1	3376	1	3376	0	0	0	0	0	0	0	0	0	0	0	0
COMMUNICATIONS (SYSTEM WIDE)	TF	1	6639	1	6639	1	6639	0	0	0	0	0	0	0	0	0	0	0	0
YARDS & SHOPS (SYSTEM WIDE)	EA	1	4875	1	4875	1	4875	0	0	0	0	0	0	0	0	0	0	0	0
GALLERY CARS (SYSTEMWIDE)	EA	15	27000	15	27000	15	27000	0	0	0	0	0	0	0	0	0	0	0	0
LOCOMOTIVES (SYSTEMWIDE)	EA	23	101200	23	101200	23	101200	0	0	0	0	0	0	0	0	0	0	0	0
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	23	-80500	23	-80500	23	-80500	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	1	9674	1	9674	1	9674	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :			$338063		$336683		$335859		$0		$0		$0		$0		$0		$0
NON-CONSTRUCTION COSTS																			
RIGHT OF WAY & RELOCATION	EA	5	21872	5	19747	5	21847	0	0	0	0	0	0	0	0	0	0	0	0
ENGINEERING & MANAGEMENT		0	76212	0	75654	0	75658	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal NON-CONSTRUCTION COSTS :			$98084		$95401		$97505		$0		$0		$0		$0		$0		$0
CONTINGENCY																			
CONTINGENCY		0	85876	0	85098	0	85352	0	0	0	0	0	0	0	0	0	0	0	0
ESCALATION																			
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																			
PROJECT RESERVE		0	39377	0	38990	0	39113	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL :			$561400		$556172		$557829		$0		$0		$0		$0		$0		$0

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

09/19/9- 10:44:33
BY:KSK
ALL COSTS IN $1,000'S

ALTERNATIVE COMPARISON: 3 - PROPULSION POWER: DUALMODE DC & AC, FULL ELECTRIC

DESCRIPTION	UNIT	ALT.: 5A DUAL DC QTY	ALT.: 5A DUAL DC COST	ALT.: 5B DUAL AC QTY	ALT.: 5B DUAL AC COST	ALT.: 5C FULL ELECTRIF. QTY	ALT.: 5C FULL ELECTRIF. COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA																			
ROUTE LENGTH	RF	9860	0	9860	0	9860	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACK LENGTH	TF	43050	0	43050	0	43050	0	0	0	0	0	0	0	0	0	0	0	0	0
CONSTRUCTION COSTS																			
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	5077	2342	5077	2342	5077	2342	0	0	0	0	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	6111	7667	6111	7667	6111	7667	0	0	0	0	0	0	0	0	0	0	0	0
-STREET AND ROAD MODIFICATIONS	RF	6110	1681	6110	1681	6110	1681	0	0	0	0	0	0	0	0	0	0	0	0
-RAILROAD MODIFICATIONS	LS	2	1000	2	1000	2	1000	0	0	0	0	0	0	0	0	0	0	0	0
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	2	1200	2	1200	2	1200	0	0	0	0	0	0	0	0	0	0	0	0
-ENVIRONMENTAL MITIGATIONS	LS	3	3490	3	3490	3	3490	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	2310	231	2310	231	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - RETAINED CUT	RF	660	5320	660	5320	660	5320	0	0	0	0	0	0	0	0	0	0	0	0
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1955	58785	1955	58785	1955	58785	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	3900	83441	3900	83441	3900	83441	0	0	0	0	0	0	0	0	0	0	0	0
TERMINAL - STRUCT/FINISH	EA	1	78657	1	78657	1	78657	0	0	0	0	0	0	0	0	0	0	0	0
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	1	1491	1	1491	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWORK - BALLASTED	TF	20830	3123	20830	3123	20830	3123	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWORK - DIRECT FIXATION	TF	22220	5112	22220	5112	22220	5112	0	0	0	0	0	0	0	0	0	0	0	0
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	4	2429	4	2429	4	2429	0	0	0	0	0	0	0	0	0	0	0	0
TRACTION POWER SYSTEM (SYS WIDE)	EA	1	9830	1	6723	1	70484	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	1	3376	1	3376	2	23476	0	0	0	0	0	0	0	0	0	0	0	0
COMMUNICATIONS (SYSTEM WIDE)	TF	1	6639	1	6639	1	6639	0	0	0	0	0	0	0	0	0	0	0	0
YARDS & SHOPS (SYSTEM WIDE)	EA	1	4875	1	4875	2	5375	0	0	0	0	0	0	0	0	0	0	0	0
GALLERY CARS (SYSTEMWIDE)	EA	15	27000	15	27000	15	27000	0	0	0	0	0	0	0	0	0	0	0	0
LOCOMOTIVES (SYSTEMWIDE)	EA	23	101200	23	172500	23	110400	0	0	0	0	0	0	0	0	0	0	0	0
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	23	-80500	23	-80500	23	-80500	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	1	9674	1	9674	1	9674	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :			$338063		$406256		$428517		$0		$0		$0		$0		$0		$0
NON-CONSTRUCTION COSTS																			
RIGHT OF WAY & RELOCATION	EA	5	21872	5	21872	5	21872	0	0	0	0	0	0	0	0	0	0	0	0
ENGINEERING & MANAGEMENT		0	76212	0	77574	0	96801	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal NON-CONSTRUCTION COSTS :			$98084		$99446		$118673		$0		$0		$0		$0		$0		$0
CONTINGENCY																			
CONTINGENCY		0	85876	0	92657	0	108194	0	0	0	0	0	0	0	0	0	0	0	0
ESCALATION																			
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																			
PROJECT RESERVE		0	39377	0	41919	0	49586	0	0	0	0	0	0	0	0	0	0	0	0
T O T A L :			$561400		$640278		$704970		$0		$0		$0		$0		$0		$0

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

09/19/.. 10:44:35
BY:KSK
ALL COSTS IN $1,000'S

ALTERNATIVE COMPARISON: 4 - TRANSBAY TERMINAL VARIATIONS RELATED TO BUS SCHEME

DESCRIPTION	UNIT	ALT.: BC NO HI-RISE QTY	COST	ALT.: 3B TB SHORT QTY	COST	ALT.: 3C T/S MEDIUM QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA																			
ROUTE LENGTH	RF	9860	0	9860	0	9860	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACK LENGTH	TF	43050	0	43050	0	43050	0	0	0	0	0	0	0	0	0	0	0	0	0
CONSTRUCTION COSTS																			
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	5077	2342	5077	2342	5077	2342	0	0	0	0	0	0	0	0	0	0	0	0
-UTILITY RELOCATIONS/MODIFICATIONS	RF	6111	7667	6111	7667	6111	7667	0	0	0	0	0	0	0	0	0	0	0	0
-STREET AND ROAD MODIFICATIONS	RF	6110	1681	6110	1681	6110	1681	0	0	0	0	0	0	0	0	0	0	0	0
-RAILROAD MODIFICATIONS	LS	2	1000	2	1000	2	1000	0	0	0	0	0	0	0	0	0	0	0	0
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	2	1200	2	1200	2	1200	0	0	0	0	0	0	0	0	0	0	0	0
-ENVIRONMENTAL MITIGATIONS	LS	3	3490	3	2011	3	2011	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	2310	231	2310	231	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - RETAINED CUT	RF	660	5320	660	5320	660	5320	0	0	0	0	0	0	0	0	0	0	0	0
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	1955	58785	1955	58785	1955	58785	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	3900	83441	3900	83441	3900	83441	0	0	0	0	0	0	0	0	0	0	0	0
TERMINAL - STRUCT/FINISH	EA	1	78657	1	76242	1	78529	0	0	0	0	0	0	0	0	0	0	0	0
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	1	1491	1	1491	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWORK - BALLASTED	TF	20830	3123	20830	3123	20830	3123	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWORK - DIRECT FIXATION	TF	22220	5112	22220	5112	22220	5112	0	0	0	0	0	0	0	0	0	0	0	0
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	4	2429	4	2429	4	2429	0	0	0	0	0	0	0	0	0	0	0	0
TRACTION POWER SYSTEM (SYS WIDE)	EA	1	9830	1	9830	1	9830	0	0	0	0	0	0	0	0	0	0	0	0
SIGNALING - WAYSIDE AND STATION	LS	1	3376	1	3376	1	3376	0	0	0	0	0	0	0	0	0	0	0	0
COMMUNICATIONS (SYSTEM WIDE)	TF	1	6639	1	6639	1	6639	0	0	0	0	0	0	0	0	0	0	0	0
YARDS & SHOPS (SYSTEM WIDE)	EA	1	4875	1	4875	1	4875	0	0	0	0	0	0	0	0	0	0	0	0
GALLERY CARS (SYSTEMWIDE)	EA	15	27000	15	27000	15	27000	0	0	0	0	0	0	0	0	0	0	0	0
LOCOMOTIVES (SYSTEMWIDE)	EA	23	101200	23	101200	23	101200	0	0	0	0	0	0	0	0	0	0	0	0
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	23	-80500	23	-80500	23	-80500	0	0	0	0	0	0	0	0	0	0	0	0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	1	9674	1	9674	1	9674	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal CONSTRUCTION COSTS :			$338063		$334169		$336456		$0		$0		$0		$0		$0		$0
NON-CONSTRUCTION COSTS																			
RIGHT OF WAY & RELOCATION	EA	5	21872	5	21872	5	21872	0	0	0	0	0	0	0	0	0	0	0	0
ENGINEERING & MANAGEMENT		0	76212	0	75238	0	75810	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal NON-CONSTRUCTION COSTS :			$98084		$97110		$97682		$0		$0		$0		$0		$0		$0
CONTINGENCY																			
CONTINGENCY		0	85876	0	84828	0	85400	0	0	0	0	0	0	0	0	0	0	0	0
ESCALATION																			
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																			
PROJECT RESERVE		0	39377	0	38904	0	39178	0	0	0	0	0	0	0	0	0	0	0	0
T O T A L :			$561400		$555011		$558716		$0		$0		$0		$0		$0		$0

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

08/[illegible] 10:52:22
BY: KSK
ALL COSTS IN $1,000'S

ALTERNATIVE: _BC - BASE CASE: OPT B, SHORT TNL, NO HIRISE, YDB, DUALM

DESCRIPTION	UNIT	SEG.: 1B QTY	SEG.: 1B COST	SEG.: 2C QTY	SEG.: 2C COST	SEG.: 3 QTY	SEG.: 3 COST	SEG.: 4 QTY	SEG.: 4 COST	SEG.: 5D QTY	SEG.: 5D COST	SEG.: SW1A QTY	SEG.: SW1A COST	SEG.: SW3B QTY	SEG.: SW3B COST	SEG.: SW9 QTY	SEG.: SW9 COST	QTY	COST	TOTALS QTY	TOTALS COST
SYSTEM DATA																					
ROUTE LENGTH	RF	3935	0	2575	0	1325	0	990	0	1035	0	0	0	0	0	0	0	0	0	9860	0
TRACK LENGTH	TF	8650	0	5150	0	2650	0	5260	0	5130	0	0	0	16210	0	0	0	0	0	43050	0
CONSTRUCTION COSTS																					
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	3935	1019	150	15	0	0	990	500	1	0	0	0	1	808	0	0	0	0	5077	2342
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935	3573	150	0	0	0	990	2025	1035	1947	0	0	1	122	0	0	0	0	6111	7667
-STREET AND ROAD MODIFICATIONS	RF	3935	866	150	75	0	0	990	246	1035	494	0	0	0	0	0	0	0	0	6110	1681
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	1000	1	200	0	0	0	0	0	0	0	0	0	0	0	0	2	1200
-ENVIRONMENTAL MITIGATIONS	LS	1	516	0	0	0	0	1	100	1	2874	0	0	0	0	0	0	0	0	3	3490
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2310	231
TRACKWAY - RETAINED CUT	RF	660	5320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	5320
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965	23556	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	0	0	1955	58785
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2575	56085	1325	27356	0	0	0	0	0	0	0	0	0	0	0	0	3900	83441
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	78657	0	0	0	0	0	0	0	0	1	78657
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1491
TRACKWORK - BALLASTED	TF	4620	610	0	0	0	0	0	0	0	0	0	0	16210	2513	0	0	0	0	20830	3123
TRACKWORK - DIRECT FIXATION	TF	4030	927	5150	1185	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	0	0	22220	5112
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	665	0	0	0	0	1	610	1	30	0	0	1	1124	0	0	0	0	4	2429
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	9830	0	0	0	0	0	0	1	9830
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	1	4875	0	0	0	0	1	4875
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	0	0	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	101200	0	0	0	0	0	0	23	101200
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	0	0	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	0	0	1	9674
Subtotal CONSTRUCTION COSTS :			$39274		$58360		$28166		$39920		$85182		$111030		$9942		$-33811		$0		$338063
NON-CONSTRUCTION COSTS																					
RIGHT OF WAY & RELOCATION	EA	0	0	1	2675	0	0	1	2300	1	3200	0	0	1	1000	1	12697	0	0	5	21872
ENGINEERING & MANAGEMENT		0	9819	0	14858	0	7042	0	10210	0	21616	0	5494	0	2586	0	4587	0	0	0	76212
Subtotal NON-CONSTRUCTION COSTS :			$9819		$17533		$7042		$12510		$24816		$5494		$3586		$17284		$0		$98084
CONTINGENCY																					
CONTINGENCY		0	10175	0	15312	0	7021	0	10691	0	22390	0	13185	0	2954	0	4148	0	0	0	85876
ESCALATION																					
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																					
PROJECT RESERVE		0	4741	0	7296	0	3378	0	5050	0	10591	0	5317	0	1319	0	1685	0	0	0	39377
T O T A L :			$64009		$98501		$45607		$68171		$142979		$135026		$17801		$-10694		$0		$561400

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

08/[illegible] 10:52:07
BY: KSK
ALL COSTS IN $1,000'S

ALTERNATIVE: 2A - BASE CASE, BUT W/ OPTION A & 16TH ST YARD

DESCRIPTION	UNIT	SEG.: 1A		SEG.: 2C		SEG.: 3		SEG.: 4		SEG.: 5D		SEG.: SW1A		SEG.: SW3B		SEG.: SW9				TOTALS	
		QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA																					
ROUTE LENGTH	RF	3975	0	2575	0	1325	0	990	0	1035	0	0	0	0	0	0	0	0	0	9900	0
TRACK LENGTH	TF	8730	0	5150	0	2650	0	5260	0	5130	0	0	0	16210	0	0	0	0	0	43130	0
CONSTRUCTION COSTS																					
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	3975	1097	150	15	0	0	990	500	1	0	0	0	1	808	0	0	0	0	5117	2420
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3975	3911	150	0	0	0	990	2025	1035	1947	0	0	1	122	0	0	0	0	6151	8005
-STREET AND ROAD MODIFICATIONS	RF	3975	1578	150	75	0	0	990	246	1035	494	0	0	0	0	0	0	0	0	6150	2393
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	1000	1	200	0	0	0	0	0	0	0	0	0	0	0	0	2	1200
-ENVIRONMENTAL MITIGATIONS	LS	1	525	0	0	0	0	1	100	1	2874	0	0	0	0	0	0	0	0	3	3499
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2350	235	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2350	235
TRACKWAY - RETAINED CUT	RF	660	5320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	5320
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965	21532	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	0	0	1955	56761
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2575	56085	1325	27356	0	0	0	0	0	0	0	0	0	0	0	0	3900	83441
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	78657	0	0	0	0	0	0	0	0	1	78657
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1789	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1789
TRACKWORK - BALLASTED	TF	4700	620	0	0	0	0	0	0	0	0	0	0	16210	2513	0	0	0	0	20910	3133
TRACKWORK - DIRECT FIXATION	TF	3250	748	5150	1185	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	0	0	21440	4933
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	740	0	0	0	0	1	610	1	30	0	0	1	1124	0	0	0	0	4	2504
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	9830	0	0	0	0	0	0	1	9830
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	1	4875	0	0	0	0	1	4875
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	0	0	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	101200	0	0	0	0	0	0	23	101200
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	0	0	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	0	0	1	9674
Subtotal CONSTRUCTION COSTS :			$38595		$58360		$28166		$39920		$85182		$111030		$9942		$-33811		$0		$337384
NON-CONSTRUCTION COSTS																					
RIGHT OF WAY & RELOCATION	EA	0	0	1	2675	0	0	1	2300	1	3200	0	0	1	1000	1	12697	0	0	5	21872
ENGINEERING & MANAGEMENT		0	9649	0	14858	0	7042	0	10210	0	21616	0	5494	0	2586	0	4587	0	0	0	76042
Subtotal NON-CONSTRUCTION COSTS :			$9649		$17533		$7042		$12510		$24816		$5494		$3586		$17284		$0		$97914
CONTINGENCY																					
CONTINGENCY		0	10106	0	15312	0	7021	0	10691	0	22390	0	13185	0	2954	0	4148	0	0	0	85807
ESCALATION																					
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																					
PROJECT RESERVE		0	4668	0	7296	0	3378	0	5050	0	10591	0	5317	0	1319	0	1685	0	0	0	39304
T O T A L :			$63918		$98501		$45607		$68171		$142979		$135026		$17801		$-10694		$0		$560409

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

08/[illegible] 10:52:09
BY: KSK
ALL COSTS IN $1,000'S

ALTERNATIVE: 2BT - BASE CASE, (OPTION B) BUT W/ TOWNSEND ST YARD

DESCRIPTION	UNIT	SEG.: 1B QTY	SEG.: 1B COST	SEG.: 2C QTY	SEG.: 2C COST	SEG.: 3 QTY	SEG.: 3 COST	SEG.: 4 QTY	SEG.: 4 COST	SEG.: 5D QTY	SEG.: 5D COST	SEG.: SW1A QTY	SEG.: SW1A COST	SEG.: SW4 QTY	SEG.: SW4 COST	SEG.: SW9 QTY	SEG.: SW9 COST	QTY	COST	TOTALS QTY	TOTALS COST
SYSTEM DATA																					
ROUTE LENGTH	RF	3935	0	2575	0	1325	0	990	0	1035	0	0	0	0	0	0	0	0	0	9860	0
TRACK LENGTH	TF	8650	0	5150	0	2650	0	5260	0	5130	0	0	0	19010	0	0	0	0	0	45850	0
CONSTRUCTION COSTS																					
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	3935	1019	150	15	0	0	990	500	1	0	0	0	0	0	0	0	0	0	5076	1534
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935	3573	150	0	0	0	990	2025	1035	1947	0	0	1	86	0	0	0	0	6111	7631
-STREET AND ROAD MODIFICATIONS	RF	3935	866	150	75	0	0	990	246	1035	494	0	0	0	0	0	0	0	0	6110	1681
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	1000	1	200	0	0	0	0	0	0	0	0	0	0	0	0	2	1200
-ENVIRONMENTAL MITIGATIONS	LS	1	516	0	0	0	0	1	100	1	2874	0	0	0	0	0	0	0	0	3	3490
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2310	231
TRACKWAY - RETAINED CUT	RF	660	5320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	5320
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965	23556	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	0	0	1955	58785
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2575	56085	1325	27356	0	0	0	0	0	0	0	0	0	0	0	0	3900	83441
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	78657	0	0	0	0	0	0	0	0	1	78657
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1491
TRACKWORK - BALLASTED	TF	4620	610	0	0	0	0	0	0	0	0	0	0	19010	2947	0	0	0	0	23630	3557
TRACKWORK - DIRECT FIXATION	TF	4030	927	5150	1185	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	0	0	22220	5112
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	665	0	0	0	0	1	610	1	30	0	0	1	975	0	0	0	0	4	2280
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	9830	0	0	0	0	0	0	1	9830
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	1	4917	0	0	0	0	1	4917
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	0	0	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	101200	0	0	0	0	0	0	23	101200
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	0	0	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	0	0	1	9674
Subtotal CONSTRUCTION COSTS :			$39274		$58360		$28166		$39920		$85182		$111030		$9425		$-33811		$0		$337546
NON-CONSTRUCTION COSTS																					
RIGHT OF WAY & RELOCATION	EA	0	0	1	2675	0	0	1	2300	1	3200	0	0	0	0	1	12697	0	0	4	20872
ENGINEERING & MANAGEMENT		0	9819	0	14858	0	7042	0	10210	0	21616	0	5494	0	2356	0	4587	0	0	0	75982
Subtotal NON-CONSTRUCTION COSTS :			$9819		$17533		$7042		$12510		$24816		$5494		$2356		$17284		$0		$96854
CONTINGENCY																					
CONTINGENCY		0	10175	0	15312	0	7021	0	10691	0	22390	0	13185	0	2460	0	4148	0	0	0	85382
ESCALATION																					
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																					
PROJECT RESERVE		0	4741	0	7296	0	3378	0	5050	0	10591	0	5317	0	1139	0	1685	0	0	0	39197
TOTAL :			$64009		$98501		$45607		$68171		$142979		$135026		$15380		$-10694		$0		$558979

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

08/[illegible] 10:52:11
BY: KSK
ALL COSTS IN $1,000'S

ALTERNATIVE: 2C - BASE CASE, BUT W/ OPTION C & 16TH ST YARD

DESCRIPTION	UNIT	SEG.: 1C QTY	SEG.: 1C COST	SEG.: 2C QTY	SEG.: 2C COST	SEG.: 3 QTY	SEG.: 3 COST	SEG.: 4 QTY	SEG.: 4 COST	SEG.: 5D QTY	SEG.: 5D COST	SEG.: SW1A QTY	SEG.: SW1A COST	SEG.: SW3B QTY	SEG.: SW3B COST	SEG.: SW9 QTY	SEG.: SW9 COST	QTY	COST	TOTALS QTY	TOTALS COST
SYSTEM DATA																					
ROUTE LENGTH	RF	4800	0	2575	0	1325	0	990	0	1035	0	0	0	0	0	0	0	0	0	10725	0
TRACK LENGTH	TF	10380	0	5150	0	2650	0	5260	0	5130	0	0	0	16210	0	0	0	0	0	44780	0
CONSTRUCTION COSTS																					
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	4800	1224	150	15	0	0	990	500	1	0	0	0	1	808	0	0	0	0	5942	2547
-UTILITY RELOCATIONS/MODIFICATIONS	RF	4800	13714	150	0	0	0	990	2025	1035	1947	0	0	1	122	0	0	0	0	6976	17808
-STREET AND ROAD MODIFICATIONS	RF	4800	1330	150	75	0	0	990	246	1035	494	0	0	0	0	0	0	0	0	6975	2145
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	1000	1	200	0	0	0	0	0	0	0	0	0	0	0	0	2	1200
-ENVIRONMENTAL MITIGATIONS	LS	1	500	0	0	0	0	1	100	1	2874	0	0	0	0	0	0	0	0	3	3474
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	170	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	170	17
TRACKWAY - RETAINED CUT	RF	700	5642	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	700	5642
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3950	82110	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	0	0	4940	117339
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2575	56085	1325	27356	0	0	0	0	0	0	0	0	0	0	0	0	3900	83441
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	78657	0	0	0	0	0	0	0	0	1	78657
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWORK - BALLASTED	TF	340	45	0	0	0	0	0	0	0	0	0	0	16210	2513	0	0	0	0	16550	2558
TRACKWORK - DIRECT FIXATION	TF	10040	2309	5150	1185	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	0	0	28230	6494
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	390	0	0	0	0	1	610	1	30	0	0	1	1124	0	0	0	0	4	2154
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	9830	0	0	0	0	0	0	1	9830
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	1	4875	0	0	0	0	1	4875
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	0	0	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	101200	0	0	0	0	0	0	23	101200
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	0	0	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	0	0	1	9674
Subtotal CONSTRUCTION COSTS :			$107781		$58360		$28166		$39920		$85182		$111030		$9942		$-33811		$0		$406570
NON-CONSTRUCTION COSTS																					
RIGHT OF WAY & RELOCATION	EA	0	0	1	2675	0	0	1	2300	1	3200	0	0	1	1000	1	12697	0	0	5	21872
ENGINEERING & MANAGEMENT		0	26945	0	14858	0	7042	0	10210	0	21616	0	5494	0	2586	0	4587	0	0	0	93338
Subtotal NON-CONSTRUCTION COSTS :			$26945		$17533		$7042		$12510		$24816		$5494		$3586		$17284		$0		$115210
CONTINGENCY																					
CONTINGENCY		0	27826	0	15312	0	7021	0	10691	0	22390	0	13185	0	2954	0	4148	0	0	0	103527
ESCALATION																					
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																					
PROJECT RESERVE		0	13004	0	7296	0	3378	0	5050	0	10591	0	5317	0	1319	0	1685	0	0	0	47640
TOTAL :			$175556		$98501		$45607		$68171		$142979		$135026		$17801		$-10694		$0		$672947

ICF KAISER ENGINEERS

CalTrain Downtown Extension

JOB NO. 65928-005-06 REV. NO. E

08/26/96 10:52:02

BY: KSK

ALL COSTS IN $1,000'S

ALTERNATIVE: 1A - BASE CASE, BUT W/ LONG TUNNEL

DESCRIPTION	UNIT	SEG.: 1B QTY	SEG.: 1B COST	SEG.: 2A QTY	SEG.: 2A COST	SEG.: 3 QTY	SEG.: 3 COST	SEG.: 4 QTY	SEG.: 4 COST	SEG.: 5D QTY	SEG.: 5D COST	SEG.: SW1A QTY	SEG.: SW1A COST	SEG.: SW3B QTY	SEG.: SW3B COST	SEG.: SW9 QTY	SEG.: SW9 COST	QTY	COST	TOTALS QTY	TOTALS COST
SYSTEM DATA																					
ROUTE LENGTH	RF	3935	0	2215	0	1325	0	990	0	1035	0	0	0	0	0	0	0	0	0	9500	0
TRACK LENGTH	TF	8650	0	4430	0	2650	0	5260	0	5130	0	0	0	16210	0	0	0	0	0	42330	0
CONSTRUCTION COSTS																					
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	3935	1019	60	6	0	0	990	500	1	0	0	0	1	808	0	0	0	0	4987	2333
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935	3573	60	1071	0	0	990	2025	1035	1947	0	0	1	122	0	0	0	0	6021	8738
-STREET AND ROAD MODIFICATIONS	RF	3935	866	60	120	0	0	990	246	1035	494	0	0	0	0	0	0	0	0	6020	1726
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	2500	1	200	0	0	0	0	0	0	0	0	0	0	0	0	2	2700
-ENVIRONMENTAL MITIGATIONS	LS	1	516	0	0	0	0	1	100	1	2874	0	0	0	0	0	0	0	0	3	3490
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2310	231
TRACKWAY - RETAINED CUT	RF	660	5320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	5320
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965	23556	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	0	0	1955	58785
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2215	52264	1325	27356	0	0	0	0	0	0	0	0	0	0	0	0	3540	79620
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	78657	0	0	0	0	0	0	0	0	1	78657
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1491
TRACKWORK - BALLASTED	TF	4620	610	0	0	0	0	0	0	0	0	0	0	16210	2513	0	0	0	0	20830	3123
TRACKWORK - DIRECT FIXATION	TF	4030	927	4430	1019	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	0	0	21500	4946
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	665	0	0	0	0	1	610	1	30	0	0	1	1124	0	0	0	0	4	2429
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	9830	0	0	0	0	0	0	1	9830
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	1	4875	0	0	0	0	1	4875
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	0	0	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	101200	0	0	0	0	0	0	23	101200
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	0	0	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	0	0	1	9674
Subtotal CONSTRUCTION COSTS :			$39274		$56980		$28166		$39920		$85182		$111030		$9942		$-33811		$0		$336683
NON-CONSTRUCTION COSTS																					
RIGHT OF WAY & RELOCATION	EA	0	0	1	550	0	0	1	2300	1	3200	0	0	1	1000	1	12697	0	0	5	19747
ENGINEERING & MANAGEMENT		0	9819	0	14300	0	7042	0	10210	0	21616	0	5494	0	2586	0	4587	0	0	0	75654
Subtotal NON-CONSTRUCTION COSTS :			$9819		$14850		$7042		$12510		$24816		$5494		$3586		$17284		$0		$95401
CONTINGENCY																					
CONTINGENCY		0	10175	0	14534	0	7021	0	10691	0	22390	0	13185	0	2954	0	4148	0	0	0	85098
ESCALATION																					
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																					
PROJECT RESERVE		0	4741	0	6909	0	3378	0	5050	0	10591	0	5317	0	1319	0	1685	0	0	0	38990
TOTAL :			$64009		$93273		$45607		$68171		$142979		$135026		$17801		$-10694		$0		$556172

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

08/2[illegible] 10:52:04
BY: KSK
ALL COSTS IN $1,000'S

ALTERNATIVE: 1B - BASE CASE, BUT W/ MEDIUM TUNNEL

DESCRIPTION	UNIT	SEG.: 1B QTY	SEG.: 1B COST	SEG.: 2B QTY	SEG.: 2B COST	SEG.: 3 QTY	SEG.: 3 COST	SEG.: 4 QTY	SEG.: 4 COST	SEG.: 5D QTY	SEG.: 5D COST	SEG.: SW1A QTY	SEG.: SW1A COST	SEG.: SW3B QTY	SEG.: SW3B COST	SEG.: SW9 QTY	SEG.: SW9 COST	QTY	COST	TOTALS QTY	TOTALS COST
SYSTEM DATA																					
ROUTE LENGTH	RF	3935	0	2400	0	1325	0	990	0	1035	0	0	0	0	0	0	0	0	0	9685	0
TRACK LENGTH	TF	8650	0	4800	0	2650	0	5260	0	5130	0	0	0	16210	0	0	0	0	0	42700	0
CONSTRUCTION COSTS																					
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	3935	1019	150	15	0	0	990	500	1	0	0	0	1	808	0	0	0	0	5077	2342
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935	3573	150	0	0	0	990	2025	1035	1947	0	0	1	122	0	0	0	0	6111	7667
-STREET AND ROAD MODIFICATIONS	RF	3935	866	150	75	0	0	990	246	1035	494	0	0	0	0	0	0	0	0	6110	1681
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	1600	1	200	0	0	0	0	0	0	0	0	0	0	0	0	2	1800
-ENVIRONMENTAL MITIGATIONS	LS	1	516	0	0	0	0	1	100	1	2874	0	0	0	0	0	0	0	0	3	3490
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2310	231
TRACKWAY - RETAINED CUT	RF	660	5320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	5320
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965	23556	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	0	0	1955	58785
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2400	53362	1325	27356	0	0	0	0	0	0	0	0	0	0	0	0	3725	80718
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	78657	0	0	0	0	0	0	0	0	1	78657
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1491
TRACKWORK - BALLASTED	TF	4620	610	0	0	0	0	0	0	0	0	0	0	16210	2513	0	0	0	0	20830	3123
TRACKWORK - DIRECT FIXATION	TF	4030	927	4800	1104	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	0	0	21870	5031
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	665	0	0	0	0	1	610	1	30	0	0	1	1124	0	0	0	0	4	2429
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	9830	0	0	0	0	0	0	1	9830
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	1	4875	0	0	0	0	1	4875
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	0	0	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	101200	0	0	0	0	0	0	23	101200
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	0	0	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	0	0	1	9674
Subtotal CONSTRUCTION COSTS :			$39274		$56156		$28166		$39920		$85182		$111030		$9942		$-33811		$0		$335859
NON-CONSTRUCTION COSTS																					
RIGHT OF WAY & RELOCATION	EA	0	0	1	2650	0	0	1	2300	1	3200	0	0	1	1000	1	12697	0	0	5	21847
ENGINEERING & MANAGEMENT		0	9819	0	14304	0	7042	0	10210	0	21616	0	5494	0	2586	0	4587	0	0	0	75658
Subtotal NON-CONSTRUCTION COSTS :			$9819		$16954		$7042		$12510		$24816		$5494		$3586		$17284		$0		$97505
CONTINGENCY																					
CONTINGENCY		0	10175	0	14788	0	7021	0	10691	0	22390	0	13185	0	2954	0	4148	0	0	0	85352
ESCALATION																					
ESCALATION NOT INCLUDED		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																					
PROJECT RESERVE		0	4741	0	7032	0	3378	0	5050	0	10591	0	5317	0	1319	0	1685	0	0	0	39113
T O T A L :			$64009		$94930		$45607		$68171		$142979		$135026		$17801		$-10694		$0		$557829

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

08/[illegible] 10:52:18
BY: KSK
ALL COSTS IN $1,000'S

ALTERNATIVE: 5B - BASE CASE, BUT W/ ELECTRIC POWER TRAILER

DESCRIPTION	UNIT	SEG.: 1B		SEG.: 2C		SEG.: 3		SEG.: 4		SEG.: 5D		SEG.: SW1B		SEG.: SW3B		SEG.: SW9				TOTALS	
		QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST	QTY	COST
SYSTEM DATA																					
ROUTE LENGTH	RF	3935	0	2575	0	1325	0	990	0	1035	0	0	0	0	0	0	0	0	0	9860	0
TRACK LENGTH	TF	8650	0	5150	0	2650	0	5260	0	5130	0	0	0	16210	0	0	0	0	0	43050	0
CONSTRUCTION COSTS																					
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	3935	1019	150	15	0	0	990	500	1	0	0	0	1	808	0	0	0	0	5077	2342
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935	3573	150	0	0	0	990	2025	1035	1947	0	0	1	122	0	0	0	0	6111	7667
-STREET AND ROAD MODIFICATIONS	RF	3935	866	150	75	0	0	990	246	1035	494	0	0	0	0	0	0	0	0	6110	1681
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	1000	1	200	0	0	0	0	0	0	0	0	0	0	0	0	2	1200
-ENVIRONMENTAL MITIGATIONS	LS	1	516	0	0	0	0	1	100	1	2874	0	0	0	0	0	0	0	0	3	3490
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2310	231
TRACKWAY - RETAINED CUT	RF	660	5320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	5320
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965	23556	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	0	0	1955	58785
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2575	56085	1325	27356	0	0	0	0	0	0	0	0	0	0	0	0	3900	83441
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	78657	0	0	0	0	0	0	0	0	1	78657
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1491
TRACKWORK - BALLASTED	TF	4620	610	0	0	0	0	0	0	0	0	0	0	16210	2513	0	0	0	0	20830	3123
TRACKWORK - DIRECT FIXATION	TF	4030	927	5150	1185	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	0	0	22220	5112
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	665	0	0	0	0	1	610	1	30	0	0	1	1124	0	0	0	0	4	2429
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	6723	0	0	0	0	0	0	1	6723
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	1	4875	0	0	0	0	1	4875
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	0	0	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	172500	0	0	0	0	0	0	23	172500
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	0	0	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	0	0	1	9674
Subtotal CONSTRUCTION COSTS :			$39274		$58360		$28166		$39920		$85182		$179223		$9942		$-33811		$0		$406256
NON-CONSTRUCTION COSTS																					
RIGHT OF WAY & RELOCATION	EA	0	0	1	2675	0	0	1	2300	1	3200	0	0	1	1000	1	12697	0	0	5	21872
ENGINEERING & MANAGEMENT		0	9819	0	14858	0	7042	0	10210	0	21616	0	6856	0	2586	0	4587	0	0	0	77574
Subtotal NON-CONSTRUCTION COSTS :			$9819		$17533		$7042		$12510		$24816		$6856		$3586		$17284		$0		$99446
CONTINGENCY																					
CONTINGENCY		0	10175	0	15312	0	7021	0	10691	0	22390	0	19966	0	2954	0	4148	0	0	0	92657
ESCALATION																					
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																					
PROJECT RESERVE		0	4741	0	7296	0	3378	0	5050	0	10591	0	7859	0	1319	0	1685	0	0	0	41919
T O T A L :			$64009		$98501		$45607		$68171		$142979		$213904		$17801		$-10694		$0		$640278

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

08/[illegible] 10:52:20
BY: KSK
ALL COSTS IN $1,000'S

ALTERNATIVE: 5C - BASE CASE, BUT W/ 25KV AC TO GILROY

DESCRIPTION	UNIT	SEG.: 1B QTY	SEG.: 1B COST	SEG.: 2C QTY	SEG.: 2C COST	SEG.: 3 QTY	SEG.: 3 COST	SEG.: 4 QTY	SEG.: 4 COST	SEG.: 5D QTY	SEG.: 5D COST	SEG.: SW2 QTY	SEG.: SW2 COST	SEG.: SW3B QTY	SEG.: SW3B COST	SEG.: SW9 QTY	SEG.: SW9 COST	QTY	COST	TOTALS QTY	TOTALS COST
SYSTEM DATA																					
ROUTE LENGTH	RF	3935	0	2575	0	1325	0	990	0	1035	0	0	0	0	0	0	0	0	0	9860	0
TRACK LENGTH	TF	8650	0	5150	0	2650	0	5260	0	5130	0	0	0	16210	0	0	0	0	0	43050	0
CONSTRUCTION COSTS																					
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	3935	1019	150	15	0	0	990	500	1	0	0	0	1	808	0	0	0	0	5077	2342
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935	3573	150	0	0	0	990	2025	1035	1947	0	0	1	122	0	0	0	0	6111	7667
-STREET AND ROAD MODIFICATIONS	RF	3935	866	150	75	0	0	990	246	1035	494	0	0	0	0	0	0	0	0	6110	1681
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	1000	1	200	0	0	0	0	0	0	0	0	0	0	0	0	2	1200
-ENVIRONMENTAL MITIGATIONS	LS	1	516	0	0	0	0	1	100	1	2874	0	0	0	0	0	0	0	0	3	3490
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2310	231
TRACKWAY - RETAINED CUT	RF	660	5320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	5320
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965	23556	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	0	0	1955	58785
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2575	56085	1325	27356	0	0	0	0	0	0	0	0	0	0	0	0	3900	83441
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	78657	0	0	0	0	0	0	0	0	1	78657
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1491
TRACKWORK - BALLASTED	TF	4620	610	0	0	0	0	0	0	0	0	0	0	16210	2513	0	0	0	0	20830	3123
TRACKWORK - DIRECT FIXATION	TF	4030	927	5150	1185	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	0	0	22220	5112
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	665	0	0	0	0	1	610	1	30	0	0	1	1124	0	0	0	0	4	2429
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	70484	0	0	0	0	0	0	1	70484
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	1	20100	0	0	1	3376	0	0	2	23476
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	500	1	4875	0	0	0	0	2	5375
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	0	0	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	110400	0	0	0	0	0	0	23	110400
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	0	0	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	0	0	1	9674
Subtotal CONSTRUCTION COSTS :			$39274		$58360		$28166		$39920		$85182		$201484		$9942		$-33811		$0		$428517
NON-CONSTRUCTION COSTS																					
RIGHT OF WAY & RELOCATION	EA	0	0	1	2675	0	0	1	2300	1	3200	0	0	1	1000	1	12697	0	0	5	21872
ENGINEERING & MANAGEMENT		0	9819	0	14858	0	7042	0	10210	0	21616	0	26083	0	2586	0	4587	0	0	0	96801
Subtotal NON-CONSTRUCTION COSTS :			$9819		$17533		$7042		$12510		$24816		$26083		$3586		$17284		$0		$118673
CONTINGENCY																					
CONTINGENCY		0	10175	0	15312	0	7021	0	10691	0	22390	0	35503	0	2954	0	4148	0	0	0	108194
ESCALATION																					
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																					
PROJECT RESERVE		0	4741	0	7296	0	3378	0	5050	0	10591	0	15526	0	1319	0	1685	0	0	0	49586
T O T A L :			$64009		$98501		$45607		$68171		$142979		$278596		$17801		$-10694		$0		$704970

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

08/[illegible] 10:52:13
BY: KSK
ALL COSTS IN $1,000'S

ALTERNATIVE: 3B - BASE CASE, BUT W/ TRANSBAY SHORT BUS TERMINAL

DESCRIPTION	UNIT	SEG.: 1B QTY	SEG.: 1B COST	SEG.: 2C QTY	SEG.: 2C COST	SEG.: 3 QTY	SEG.: 3 COST	SEG.: 4 QTY	SEG.: 4 COST	SEG.: 5B QTY	SEG.: 5B COST	SEG.: SW1A QTY	SEG.: SW1A COST	SEG.: SW3B QTY	SEG.: SW3B COST	SEG.: SW9 QTY	SEG.: SW9 COST	QTY	COST	TOTALS QTY	TOTALS COST
SYSTEM DATA																					
ROUTE LENGTH	RF	3935	0	2575	0	1325	0	990	0	1035	0	0	0	0	0	0	0	0	0	9860	0
TRACK LENGTH	TF	8650	0	5150	0	2650	0	5260	0	5130	0	0	0	16210	0	0	0	0	0	43050	0
CONSTRUCTION COSTS																					
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	3935	1019	150	15	0	0	990	500	1	0	0	0	1	808	0	0	0	0	5077	2342
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935	3573	150	0	0	0	990	2025	1035	1947	0	0	1	122	0	0	0	0	6111	7667
-STREET AND ROAD MODIFICATIONS	RF	3935	866	150	75	0	0	990	246	1035	494	0	0	0	0	0	0	0	0	6110	1681
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	1000	1	200	0	0	0	0	0	0	0	0	0	0	0	0	2	1200
-ENVIRONMENTAL MITIGATIONS	LS	1	516	0	0	0	0	1	100	1	1395	0	0	0	0	0	0	0	0	3	2011
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2310	231
TRACKWAY - RETAINED CUT	RF	660	5320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	5320
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965	23556	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	0	0	1955	58785
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2575	56085	1325	27356	0	0	0	0	0	0	0	0	0	0	0	0	3900	83441
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	76242	0	0	0	0	0	0	0	0	1	76242
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1491
TRACKWORK - BALLASTED	TF	4620	610	0	0	0	0	0	0	0	0	0	0	16210	2513	0	0	0	0	20830	3123
TRACKWORK - DIRECT FIXATION	TF	4030	927	5150	1185	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	0	0	22220	5112
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	665	0	0	0	0	1	610	1	30	0	0	1	1124	0	0	0	0	4	2429
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	9830	0	0	0	0	0	0	1	9830
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	0	0	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	0	0	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	1	4875	0	0	0	0	1	4875
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	0	0	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	101200	0	0	0	0	0	0	23	101200
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	0	0	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	0	0	1	9674
Subtotal CONSTRUCTION COSTS :			$39274		$58360		$28166		$39920		$81288		$111030		$9942		$-33811		$0		$334169
NON-CONSTRUCTION COSTS																					
RIGHT OF WAY & RELOCATION	EA	0	0	1	2675	0	0	1	2300	1	3200	0	0	1	1000	1	12697	0	0	5	21872
ENGINEERING & MANAGEMENT		0	9819	0	14858	0	7042	0	10210	0	20642	0	5494	0	2586	0	4587	0	0	0	75238
Subtotal NON-CONSTRUCTION COSTS :			$9819		$17533		$7042		$12510		$23842		$5494		$3586		$17284		$0		$97110
CONTINGENCY																					
CONTINGENCY		0	10175	0	15312	0	7021	0	10691	0	21342	0	13185	0	2954	0	4148	0	0	0	84828
ESCALATION																					
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																					
PROJECT RESERVE		0	4741	0	7296	0	3378	0	5050	0	10118	0	5317	0	1319	0	1685	0	0	0	38904
T O T A L :			$64009		$98501		$45607		$68171		$136590		$135026		$17801		$-10694		$0		$555011

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06 REV. NO. E

08/[illegible] 10:52:15
BY: KSK
ALL COSTS IN $1,000'S

ALTERNATIVE: 3C - BASE CASE, BUT W/ TRANSBAY MEDIUM BUS TERMINAL

DESCRIPTION	UNIT	SEG.: 1B QTY	SEG.: 1B COST	SEG.: 2C QTY	SEG.: 2C COST	SEG.: 3 QTY	SEG.: 3 COST	SEG.: 4 QTY	SEG.: 4 COST	SEG.: 5C QTY	SEG.: 5C COST	SEG.: SW1A QTY	SEG.: SW1A COST	SEG.: SW3B QTY	SEG.: SW3B COST	SEG.: SW9 QTY	SEG.: SW9 COST	TOTALS QTY	TOTALS COST
SYSTEM DATA																			
ROUTE LENGTH	RF	3935	0	2575	0	1325	0	990	0	1035	0	0	0	0	0	0	0	9860	0
TRACK LENGTH	TF	8650	0	5150	0	2650	0	5260	0	5130	0	0	0	16210	0	0	0	43050	0
CONSTRUCTION COSTS																			
SITE MODIFICATIONS:		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-DEMOLITION	RF	3935	1019	150	15	0	0	990	500	1	0	0	0	1	808	0	0	5077	2342
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935	3573	150	0	0	0	990	2025	1035	1947	0	0	1	122	0	0	6111	7667
-STREET AND ROAD MODIFICATIONS	RF	3935	866	150	75	0	0	990	246	1035	494	0	0	0	0	0	0	6110	1681
-RAILROAD MODIFICATIONS	LS	1	500	0	0	0	0	0	0	0	0	0	0	1	500	0	0	2	1000
-STRUCTURE MODIFICATIONS	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-UNDERPINNING	LS	0	0	1	1000	1	200	0	0	0	0	0	0	0	0	0	0	2	1200
-ENVIRONMENTAL MITIGATIONS	LS	1	516	0	0	0	0	1	100	1	1395	0	0	0	0	0	0	3	2011
TRACKWAY - AERIAL	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRACKWAY - AT GRADE	RF	2310	231	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2310	231
TRACKWAY - RETAINED CUT	RF	660	5320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	5320
SUBWAY:	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965	23556	0	0	0	0	990	35229	0	0	0	0	0	0	0	0	1955	58785
-CUT AND COVER (MESH/ROCK BOLTS)	RF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-MINED TUNNEL	RF	0	0	2575	56085	1325	27356	0	0	0	0	0	0	0	0	0	0	3900	83441
TERMINAL - STRUCT/FINISH	EA	0	0	0	0	0	0	0	0	1	78529	0	0	0	0	0	0	1	78529
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1	1491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1491
TRACKWORK - BALLASTED	TF	4620	610	0	0	0	0	0	0	0	0	0	0	16210	2513	0	0	20830	3123
TRACKWORK - DIRECT FIXATION	TF	4030	927	5150	1185	2650	610	5260	1210	5130	1180	0	0	0	0	0	0	22220	5112
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1	665	0	0	0	0	1	610	1	30	0	0	1	1124	0	0	4	2429
TRACTION POWER SYSTEM (SYS WIDE)	EA	0	0	0	0	0	0	0	0	0	0	1	9830	0	0	0	0	1	9830
SIGNALING - WAYSIDE AND STATION	LS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3376	1	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6639	1	6639
YARDS & SHOPS (SYSTEM WIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	1	4875	0	0	1	4875
GALLERY CARS (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27000	15	27000
LOCOMOTIVES (SYSTEMWIDE)	EA	0	0	0	0	0	0	0	0	0	0	23	101200	0	0	0	0	23	101200
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	-80500	23	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9674	1	9674
Subtotal CONSTRUCTION COSTS :			$39274		$58360		$28166		$39920		$83575		$111030		$9942		$-33811		$336456
NON-CONSTRUCTION COSTS																			
RIGHT OF WAY & RELOCATION	EA	0	0	1	2675	0	0	1	2300	1	3200	0	0	1	1000	1	12697	5	21872
ENGINEERING & MANAGEMENT		0	9819	0	14858	0	7042	0	10210	0	21214	0	5494	0	2586	0	4587	0	75810
Subtotal NON-CONSTRUCTION COSTS :			$9819		$17533		$7042		$12510		$24414		$5494		$3586		$17284		$97682
CONTINGENCY																			
CONTINGENCY		0	10175	0	15312	0	7021	0	10691	0	21914	0	13185	0	2954	0	4148	0	85400
ESCALATION																			
ESCALATION (NOT INCLUDED)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECT RESERVE																			
PROJECT RESERVE		0	4741	0	7296	0	3378	0	5050	0	10392	0	5317	0	1319	0	1685	0	39178
T O T A L :			$64009		$98501		$45607		$68171		$140295		$135026		$17801		$-10694		$558716

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 11:49:06
BY KSK
REV No. E

SEGMENT: 1A - BERRY TO 3RD & TOWN, OPTION A

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	3975.0		1.00	
TRACK LENGTH	TF	8730.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION INCL EXISTING TERMINAL	RF	3975.0	100	2.76	1097
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3975.0	984	1.00	3911
-STREET AND ROAD MODIFICATIONS	RF	3975.0	397	1.00	1578
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	525000	1.00	525
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF	2350.0	100	1.00	235
TRACKWAY - RETAINED CUT	RF	660.0	9483	0.85	5320
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965.0	19071	1.17	21532
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1.0	1788567	1.00	1789
TRACKWORK - BALLASTED	TF	4700.0	132	1.00	620
TRACKWORK - DIRECT FIXATION	TF	3250.0	230	1.00	748
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	740000	1.00	740
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
GALLERY CARS (SYSTEMWIDE)	EA			1.00	
LOCOMOTIVES (SYSTEMWIDE)	EA			1.00	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$38595
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	9649
Subtotal NON-CONSTRUCTION COSTS :					$9649
CONTINGENCY					
CONTINGENCY				1.00	10106
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	4668
TOTAL :					$63018

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 11:49:07
BY KSK
REV No. E

SEGMENT: 1B - BERRY TO 3RD & TOWN, OPTION B

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	3935.0		1.00	
TRACK LENGTH	TF	8650.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION INCL EXISTING TERMINAL	RF	3935.0	100	2.59	1019
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935.0	908	1.00	3573
-STREET AND ROAD MODIFICATIONS	RF	3935.0	220	1.00	866
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	516000	1.00	516
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF	2310.0	100	1.00	231
TRACKWAY - RETAINED CUT	RF	660.0	9483	0.85	5320
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965.0	19071	1.28	23556
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1.0	1491187	1.00	1491
TRACKWORK - BALLASTED	TF	4620.0	132	1.00	610
TRACKWORK - DIRECT FIXATION	TF	4030.0	230	1.00	927
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	665000	1.00	665
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
GALLERY CARS (SYSTEMWIDE)	EA			1.00	
LOCOMOTIVES (SYSTEMWIDE)	EA			1.00	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$39274
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	9819
Subtotal NON-CONSTRUCTION COSTS :					$9819
CONTINGENCY					
CONTINGENCY				1.00	10175
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	4741
TOTAL :					$64009

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 11:49:08
BY KSK
REV No. E

SEGMENT: 1C - IRWIN TO 3RD & TOWN, OPTION C

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	4800.0		1.00	
TRACK LENGTH	TF	10380.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION INCL EXISTING TERMINAL	RF	4800.0	100	2.55	1224
-UTILITY RELOCATIONS/MODIFICATIONS	RF	4800.0	2857	1.00	13714
-STREET AND ROAD MODIFICATIONS	RF	4800.0	277	1.00	1330
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	500000	1.00	500
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF	170.0	100	1.00	17
TRACKWAY - RETAINED CUT	RF	700.0	9483	0.85	5642
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3950.0	19071	1.09	82110
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF	340.0	132	1.00	45
TRACKWORK - DIRECT FIXATION	TF	10040.0	230	1.00	2309
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	390000	1.00	390
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
GALLERY CARS (SYSTEMWIDE)	EA			1.00	
LOCOMOTIVES (SYSTEMWIDE)	EA			1.00	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$107781
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	26945
Subtotal NON-CONSTRUCTION COSTS :					$26945
CONTINGENCY					
CONTINGENCY				1.00	27826
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	13004
TOTAL :					$175556

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:30
BY KSK
REV No. E

SEGMENT: 2A - MINED TUNNEL, LONG CURVE

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	2215.0		1.00	
TRACK LENGTH	TF	4430.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	60.0	100	1.00	6
-UTILITY RELOCATIONS/MODIFICATIONS	RF	60.0	17850	1.00	1071
-STREET AND ROAD MODIFICATIONS	RF	60.0	2000	1.00	120
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS	1.0	2500000	1.00	2500
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF	2215.0	22688	1.04	52264
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	4430.0	230	1.00	1019
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$56980
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	550000	1.00	550
ENGINEERING & MANAGEMENT				1.00	14300
Subtotal NON-CONSTRUCTION COSTS :					$14850
CONTINGENCY					
CONTINGENCY				1.00	14534
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	6909
TOTAL :					$93273

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:31
BY KSK
REV No. E

SEGMENT: 2B - MINED TUNNEL, MEDIUM CURVE

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	2400.0		1.00	
TRACK LENGTH	TF	4800.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	150.0	100	1.00	15
-UTILITY RELOCATIONS/MODIFICATIONS	RF	150.0		1.00	
-STREET AND ROAD MODIFICATIONS	RF	150.0	500	1.00	75
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS	1.0	1600000	1.00	1600
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF	2400.0	22688	0.98	53362
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	4800.0	230	1.00	1104
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$56156
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	2650000	1.00	2650
ENGINEERING & MANAGEMENT				1.00	14304
Subtotal NON-CONSTRUCTION COSTS :					$16954
CONTINGENCY					
CONTINGENCY				1.00	14788
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	7032
TOTAL :					$94930

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:32
BY KSK
REV No. E

SEGMENT: 2C - MINED TUNNEL, SHORT CURVE

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	2575.0		1.00	
TRACK LENGTH	TF	5150.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	150.0	100	1.00	15
-UTILITY RELOCATIONS/MODIFICATIONS	RF	150.0		1.00	
-STREET AND ROAD MODIFICATIONS	RF	150.0	500	1.00	75
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS	1.0	1000000	1.00	1000
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF	2575.0	22688	0.96	56085
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	5150.0	230	1.00	1185
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$58360
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	2675000	1.00	2675
ENGINEERING & MANAGEMENT				1.00	14858
Subtotal NON-CONSTRUCTION COSTS :					$17533
CONTINGENCY					
CONTINGENCY				1.00	15312
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	7296
TOTAL :					$98501

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:32
BY KSK
REV No. E

SEGMENT: 3 - MINED TUNNEL, BRYANT TO FOLSOM

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	1325.0		1.00	
TRACK LENGTH	TF	2650.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS	1.0	200000	1.00	200
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF	1325.0	22688	0.91	27356
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	2650.0	230	1.00	610
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$28166
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	7042
Subtotal NON-CONSTRUCTION COSTS :					$7042
CONTINGENCY					
CONTINGENCY				1.00	7021
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	3378
TOTAL :					$45607

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:33
BY KSK
REV No. E

SEGMENT: 4 - CUT & COVER, APPROACH TO TBT

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	990.0		1.00	
TRACK LENGTH	TF	5260.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	990.0	505	1.00	500
-UTILITY RELOCATIONS/MODIFICATIONS	RF	990.0	2045	1.00	2025
-STREET AND ROAD MODIFICATIONS	RF	990.0	248	1.00	246
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	100000	1.00	100
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF			1.00	
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	990.0	35585	1.00	35229
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.15	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF		132	1.00	
TRACKWORK - DIRECT FIXATION	TF	5260.0	230	1.00	1210
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	610000	1.00	610
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$39920
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	2300000	1.00	2300
ENGINEERING & MANAGEMENT				1.00	10210
Subtotal NON-CONSTRUCTION COSTS :					$12510
CONTINGENCY					
CONTINGENCY				1.00	10691
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	5050
TOTAL :					$68171

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:34
BY KSK
REV No. E

SEGMENT: 5A - 6 TRK TRNSBAY T'MINAL, HIRISE

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	1035.0		1.00	
TRACK LENGTH	TF	5130.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0		1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1035.0	1881	1.00	1947
-STREET AND ROAD MODIFICATIONS	RF	1035.0	477	1.00	494
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2790000	1.03	2874
TRACKWAY - AERIAL	RF			0.90	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA	1.0	80587000	1.00	80587
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	5130.0	230	1.00	1180
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	30000	1.00	30
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$87112
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3200000	1.00	3200
ENGINEERING & MANAGEMENT				1.00	22098
Subtotal NON-CONSTRUCTION COSTS :					$25298
CONTINGENCY					
CONTINGENCY				1.00	22872
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	10823
TOTAL :					$146105

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:35
BY KSK
REV No. E

SEGMENT: 5B - 6 TRK T'BAY T'MINAL W/TB SHORT

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	1035.0		1.00	
TRACK LENGTH	TF	5130.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0		1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1035.0	1881	1.00	1947
-STREET AND ROAD MODIFICATIONS	RF	1035.0	477	1.00	494
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2790000	0.50	1395
TRACKWAY - AERIAL	RF			0.90	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA	1.0	76242000	1.00	76242
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	5130.0	230	1.00	1180
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	30000	1.00	30
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$81288
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3200000	1.00	3200
ENGINEERING & MANAGEMENT				1.00	20642
Subtotal NON-CONSTRUCTION COSTS :					$23842
CONTINGENCY					
CONTINGENCY				1.00	21342
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	10118
TOTAL :					$136590

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:36
BY KSK
REV No. E

SEGMENT: 5C - 6TRK T'BAY T'MINAL W/ TBMEDIUM

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	1035.0		1.00	
TRACK LENGTH	TF	5130.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0		1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1035.0	1881	1.00	1947
-STREET AND ROAD MODIFICATIONS	RF	1035.0	477	1.00	494
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2790000	0.50	1395
TRACKWAY - AERIAL	RF			0.90	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA	1.0	76242000	1.03	78529
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	5130.0	230	1.00	1180
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	30000	1.00	30
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$83575
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3200000	1.00	3200
ENGINEERING & MANAGEMENT				1.00	21214
Subtotal NON-CONSTRUCTION COSTS :					$24414
CONTINGENCY					
CONTINGENCY				1.00	21914
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	10392
TOTAL :					$140295

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:37
BY KSK
REV No. E

SEGMENT: 5D - 6 TRK T'BAY T'MINAL, NO HIRISE

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF	1035.0		1.00	
TRACK LENGTH	TF	5130.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0		1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1035.0	1881	1.00	1947
-STREET AND ROAD MODIFICATIONS	RF	1035.0	477	1.00	494
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2790000	1.03	2874
TRACKWAY - AERIAL	RF			0.90	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA	1.0	78657349	1.00	78657
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF	5130.0	230	1.00	1180
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	30000	1.00	30
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.50	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$85182
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3200000	1.00	3200
ENGINEERING & MANAGEMENT				1.00	21616
Subtotal NON-CONSTRUCTION COSTS :					$24816
CONTINGENCY					
CONTINGENCY				1.00	22390
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	10591
TOTAL :					$142979

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:38
BY KSK
REV No. E

SEGMENT: 5PS - PEDESTRIAN SUBWAY TO BART STA

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	1620500	1.00	1621
-STREET AND ROAD MODIFICATIONS	RF	1.0	450491	1.00	450
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF			1.00	
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF			1.00	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA	1.0	20208727	1.00	20209
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA				
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			1.00	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			1.00	
Subtotal CONSTRUCTION COSTS :					$22280
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	5570
Subtotal NON-CONSTRUCTION COSTS :					$5570
CONTINGENCY					
CONTINGENCY				1.00	5696
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	2684
TOTAL :					$36230

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:51:18
BY KSK
REV No. E

SEGMENT: SW1A - 1500V DC IN SF,DUAL MODE LOCOS

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF			1.00	
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF			1.00	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	9830121	1.00	9830
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA	23.0	4400000	1.00	101200
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			1.00	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			1.00	
Subtotal CONSTRUCTION COSTS :					$111030
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	5494
Subtotal NON-CONSTRUCTION COSTS :					$5494
CONTINGENCY					
CONTINGENCY				1.00	13185
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	5317
TOTAL :					$135026

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:40
BY KSK
REV No. E

SEGMENT: SW1B - 25KV AC IN SF, POWER TRAILER

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF			1.00	
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF			1.00	
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	6723161	1.00	6723
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA				
GALLERY CARS (SYSTEMWIDE)	EA				
LOCOMOTIVES (SYSTEMWIDE)	EA	23.0	7500000	1.00	172500
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			1.00	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			1.00	
Subtotal CONSTRUCTION COSTS :					$179223
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	6856
Subtotal NON-CONSTRUCTION COSTS :					$6856
CONTINGENCY					
CONTINGENCY				1.00	19966
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	7859
TOTAL :					$213904

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:41
BY KSK
REV No. E

SEGMENT: SW2 - 25KV AC, SF TO GILROY

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	70484496	1.00	70484
SIGNALING - WAYSIDE AND STATION	LS	1.0	20100000	1.00	20100
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	500000	1.00	500
GALLERY CARS (SYSTEMWIDE)	EA			1.00	
LOCOMOTIVES (SYSTEMWIDE)	EA	23.0	4800000	1.00	110400
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$201484
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	26083
Subtotal NON-CONSTRUCTION COSTS :					$26083
CONTINGENCY					
CONTINGENCY				1.00	35503
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	15526
TOTAL :					$278596

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:42
BY KSK
REV No. E

SEGMENT: SW3A - 16TH & OWENS YARD, OPTION A

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF	14775.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	808000	1.00	808
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	121500	1.00	122
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF	14475.0	155	1.00	2244
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	974000	1.00	974
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	4875400	1.00	4875
GALLERY CARS (SYSTEMWIDE)	EA			1.00	
LOCOMOTIVES (SYSTEMWIDE)	EA			1.00	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$9523
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1000000	1.00	1000
ENGINEERING & MANAGEMENT				1.00	2481
Subtotal NON-CONSTRUCTION COSTS :					$3481
CONTINGENCY					
CONTINGENCY				1.00	2871
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	1270
TOTAL :					$17145

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:43
BY KSK
REV No. E

SEGMENT: SW3B - 16TH ST STORAGE YARD, OPTION B

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF	16210.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	808000	1.00	808
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	121500	1.00	122
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF	16210.0	155	1.00	2513
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	1124000	1.00	1124
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	4875400	1.00	4875
GALLERY CARS (SYSTEMWIDE)	EA			1.00	
LOCOMOTIVES (SYSTEMWIDE)	EA			1.00	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$9942
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1000000	1.00	1000
ENGINEERING & MANAGEMENT				1.00	2586
Subtotal NON-CONSTRUCTION COSTS :					$3586
CONTINGENCY					
CONTINGENCY				1.00	2954
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	1319
TOTAL :					$17801

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:44
BY KSK
REV No. E

SEGMENT: SW3C - 16TH ST STORAGE YARD, OPTION C

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF	12130.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	808000	1.00	808
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	121500	1.00	122
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF	12130.0	155	1.00	1880
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	653000	1.00	653
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	5735460	1.00	5735
GALLERY CARS (SYSTEMWIDE)	EA			1.00	
LOCOMOTIVES (SYSTEMWIDE)	EA			1.00	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$9698
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1000000	1.00	1000
ENGINEERING & MANAGEMENT				1.00	2525
Subtotal NON-CONSTRUCTION COSTS :					$3525
CONTINGENCY					
CONTINGENCY				1.00	2992
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	1297
TOTAL :					$17512

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:37:45
BY KSK
REV No. E

SEGMENT: SW4 - TOWNSEND ST. STORAGE YARD

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF	19010.0		1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	85600	1.00	86
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS	1.0	500000	1.00	500
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF	19010.0	155	1.00	2947
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	975000	1.00	975
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	4916707	1.00	4917
GALLERY CARS (SYSTEMWIDE)	EA			1.00	
LOCOMOTIVES (SYSTEMWIDE)	EA			1.00	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA				
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP				
Subtotal CONSTRUCTION COSTS :					$9425
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	2356
Subtotal NON-CONSTRUCTION COSTS :					$2356
CONTINGENCY					
CONTINGENCY				1.00	2460
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	1139
TOTAL :					$15380

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/26/96 10:51:19
BY KSK
REV No. E

SEGMENT: SW9 - COMMON SYSTEMWIDE ELEMENTS

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			1.00	
-STREET AND ROAD MODIFICATIONS	RF			1.00	
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS			1.00	
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA			1.00	
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS	1.0	3376000	1.00	3376
COMMUNICATIONS (SYSTEM WIDE)	TF	1.0	6639000	1.00	6639
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
GALLERY CARS (SYSTEMWIDE)	EA	15.0	1800000	1.00	27000
LOCOMOTIVES (SYSTEMWIDE)	EA			1.00	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	23.0	-3500000	1.00	-80500
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	1.0	9674000	1.00	9674
Subtotal CONSTRUCTION COSTS :					$-33811
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	12697348	1.00	12697
ENGINEERING & MANAGEMENT				1.00	4587
Subtotal NON-CONSTRUCTION COSTS :					$17284
CONTINGENCY					
CONTINGENCY				1.00	4148
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	1685
TOTAL :					$-10694

CALTRAIN FINAL
JOB #65928-005-06

DEMOLITION

SEG/ OPT	LOCATION	DIST	BASE UNIT	FACT	TOTAL	REMARKS
1A	129+25 TO 144+00	1,475 RF	100	1.60	$236,000	WIDER ROUTE
1A	144+00 TO 161+00	1,700 RF	100	4.50	$765,000	EXIST TERMINAL
1A	161+00 TO 169+00	800 RF	100	1.20	$96,000	RR RAIL POSTS
	TOTAL - 1A	3975 RF			$1,097,000	
1B	129+65 TO 144+00	1,435 RF	100	1.10	$157,850	RR RAIL POSTS
1B	144+00 TO 161+00	1,700 RF	100	4.50	$765,000	EXIST TERMINAL
1B	161+00 TO 169+00	800 RF	100	1.20	$96,000	RR RAIL POSTS
	TOTAL - 1B	3135 RF			$1,018,850	
1C	121+70 TO 144+00	2,230 RF	100	1.60	$356,800	WIDER ROUTE
1C	144+00 TO 161+00	1,700 RF	100	4.50	$765,000	EXIST TERMINAL
1C	161+00 TO 169+00	870 RF	100	1.20	$104,400	RR RAIL POSTS
	TOTAL - 1C	4800 RF			$1,226,200	
2A & B					0	
3					0	
4					$500,000	
5A, B & C					$7,762,334	
SW3A					$808,000	EXISTING WAREHSE
SW3B					$808,000	EXISTING WAREHSE
SW3C					$808,000	EXISTING WAREHSE
SW4					0	

ICF KAISER ENGINEERS

Job No 65928-005-06

Sheet 1 of 1

16th St. Yard

DESIGNED BY H.W.H. DATE 4/1/96

CHECKED BY DATE

Demolish Existing Bldg.

1,015' x 130' = 132,000 SF

Conc. Demo., Say 132,000 x 1/27 = 4,900 CY

Struct. Stl. - 132,000 SF x 12#/SF = 792 T

Roofing & Siding: 2 x 1,145 x 20 = 45,800 SF

132,000

177,800 SF

	Quant.	Man-Hours	Cost
Conc. Demo. & Haul	4,900	7,007	$436,100
Struct. Stl. Demo., Haul, Salv.	792 T	2,970	$165,528
Roofing & Siding Demo. & Haul	177,800 SF	3,556	$206,643
		13,533	$808,271
		÷ 132,000 SF	÷ 132,000 SF
0214 836	1 SF	0.103/SF	$6.12/SF

CALCULATIONS ... Form No. E-6 Rev. 12-89

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 1A

Prepared by AGS, Inc.
5/23/96

SEGMENT 1A: 7th St., Townsend St.

7th to 5th: surface
5th thru 4th: U-wall
4th to 3rd: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	15" VCP	leave in place	7th to 4th	2300	0	0	
	2.	3' X 5' brick	leave in place	4th to 3rd	900	0	0	
	3.	10" force main	relocate	7th to 5th	1500	175	262,500	
	4.	4 - 9.5' X 8.3' RC boxes	leave in place	xing @ 7th/Berry	80	0	0	
	5.	10' X 7' RC on piles	leave in place	xing @ 6th	80	0	0	
	6.	6' ϕ RC on piles	leave in place	xing @ 6th	700	0	0	
	7.	9' X 7' RC on piles	leave in place	xing @ 5th	1000	0	0	
	8.	18" pipe	leave in place	xing @ 5th	500	0	0	
	9.	6.5' ϕ brick/concrete	reroute to 5th	xing @ 4th	1000	2000	2,000,000	
	10.	30" force main	raise/support in place	xing @ 4th	80	350	28,000	
	11.	21" pipe	empty to 6.5'	xing @ 4th	20	325	6,500	
	12.	Service laterals	support in place	3 between 7th/3rd	150	150	22,500	
	13.	Storm drain inlets	replace	7th to 3rd	12	2500	30,000	
		*Consolidate 4th St. sewers in new sewer routed down Townsend and 6th to Berry					Sewer Subtotal	2,349,500
Potable Water	1.	8" pipe	leave in place	7th to 3rd	3200	0	0	
	2.	12" pipe	support in place	xing @ 4th	40	200	8,000	
	3.	8" pipe	leave in place	xing @ 5th	600	0	0	
	4.	Service laterals	support in place	3 between 7th/3rd	150	100	15,000	
							Potable Water Subtotal	23,000
Auxiliary Water	1.	12" pipe	reinforce in place	xing @ 6th	50	225	11,250	
	2.	12" pipe	reroute around U-wall	xing @ 5th	600	225	135,000	
	3.	12" pipe	support in place	xing @ 4th	40	225	9,000	
							Auxiliary Water Subtotal	155,250
Gas	1.	16" CI pipe	relocate - north	4th to 3rd	900	500	450,000	
	2.	3" PL pipe	support in place	xing @ 4th	40	400	16,000	
	3.	1" PL pipe - laterals	support in place	2 between 5th/4th	80	150	12,000	
							Gas Subtotal	478,000
Electrical	1.	Medium RC box	replace		1	100000	100,000	
	2.	Large RC box	replace		1	500000	500,000	
	3.	Active conduit (3"/6")	relocate	7th to 3rd	1145	20	22,900	
	4.	Trench, joint (18"X40")	relocate	7th to 3rd	1145	40	45,800	
	5.	Overhead power poles	relocate	7th to 3rd	9	15000	135,000	
	6.	Streetlights/signals	replace	7th to 3rd	12	3800	45,600	
							Electrical Subtotal	849,300
Communications	1.	Small RC box (PacBell)	replace		4	5000	20,000	
	2.	Conduit (2"/4") (PacBell)	relocate	5th to 3rd	3800	10	38,000	
							Communications Subtotal	58,000
							Segment 1A Total	3,913,050

e984/RF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 1B

Prepared by AGS, Inc.
5/23/96

SEGMENT 1B: 7th St., Townsend St.

7th to 5th: surface
5th thru 4th: U-wall
4th to 3rd: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	15" VCP	leave in place	7th to 4th	2300	0	0	
	2.	3' X 5' brick	leave in place	4th to 3rd	900	0	0	
	3.	10" force main	leave in place	7th to 5th	1500	0	0	
	4.	4 - 9.5' X 8.3' RC boxes	leave in place	xing @ 7th/Berry	80	0	0	
	5.	10' X 7' RC on piles	leave in place	xing @ 6th	80	0	0	
	6.	6' ϕ RC on piles	leave in place	xing @ 6th	700	0	0	
	7.	9' X 7' RC on piles	leave in place	xing @ 5th	1000	0	0	
	8.	18" pipe	abandon	xing @ 5th	500	0	0	
	9.	6.5' ϕ brick/concrete	reroute to 5th	xing @ 4th	1000	2000	2,000,000	
	10.	30" force main	raise/support in place	xing @ 4th	80	350	28,000	
	11.	21" pipe	empty into 6.5'	xing @ 4th	20	325	6,500	
	12.	Service laterals	leave in place	between 7th/3rd	150	0	0	
	13.	Storm drain inlets	replace	7th to 3rd	12	2500	30,000	
		*Consolidate 4th St. sewers in new sewer routed down Townsend and 6th to Berry					Sewer Subtotal	2,064,500
Potable Water	1.	8" pipe	leave in place	7th to 3rd	3200	0	0	
	2.	12" pipe	leave in place	xing @ 4th	40	0	0	
	3.	8" pipe	reroute around U-wall	xing @ 5th	600	150	90,000	
	4.	Service laterals	leave in place	3 between 7th/3rd	150	0	0	
							Potable Water Subtotal	90,000
Auxiliary Water	1.	12" pipe	leave in place	xing @ 6th	50	225	11,250	
	2.	12" pipe	reroute around U-wall	xing @ 5th	600	225	135,000	
	3.	12" pipe	support in place	xing @ 4th	40	225	9,000	
							Auxiliary Water Subtotal	155,250
Gas	1.	16" CI pipe	relocate - north	4th to 3rd	900	500	450,000	
	2.	3" PL pipe	relocate	xing @ 4th	40	200	8,000	
	3.	1" PL pipe - laterals	leave in place	between 5th/4th	80	0	0	
							Gas Subtotal	458,000
Electrical	1.	Medium RC box	replace		1	100000	100,000	
	2.	Large RC box	replace		1	500000	500,000	
	3.	Active conduit (3"/6")	relocate	7th to 3rd	1145	20	22,900	
	4.	Trench, joint (18"X40")	relocate	7th to 3rd	1145	40	45,800	
	5.	Overhead power poles	relocate	7th to 3rd	3	15000	45,000	
	6.	Streetlights/signals	replace	7th to 3rd	9	3800	34,200	
						5000	Electrical Subtotal	747,900
Communications	1.	Small RC box (PacBell)	replace		4	5000	20,000	
	2.	Conduit (2"/4") (PacBell)	relocate	5th to 3rd	3800	10	38,000	
							Communications Subtotal	58,000
							Segment 1B Total	**3,573,650**

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Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 1C

Prepared by AGS, Inc.
5/23/96

SEGMENT 1C: 7th St., Townsend St.

7th to Irwin: surface
7th - Irwin to Berry: U-wall
Berry to 3rd: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	15" VCP	leave in place	7th to 4th	2300	0	0	
	2.	3' X 5' brick	leave in place	4th to 3rd	900	0	0	
	3.	10" force main	relocate	7th to 5th	1500	175	262,500	
	4.	4 - 9.5' X 8.3' RC boxes	lower	xing @ 7th/Berry	1	3000000	3,000,000	
	5.	10' X 7' RC on piles*	reroute to 7th/Berry	xing @ 6th	2000	3000	6,000,000	
	6.	6' ϕ RC on piles*	consolidate w/10' X 7'	xing @ 6th	2000	0	0	
	7.	9' X 7' RC on piles*	reroute to 6th	xing @ 5th	1000	2500	2,500,000	
	8.	18" pipe	abandon	xing @ 5th	500	0	0	
	9.	6.5' ϕ brick/concrete	support in place	xing @ 4th	1	300000	300,000	
	10.	30" force main	support in place	xing @ 4th	40	350	14,000	
	11.	21" pipe	support in place	xing @ 4th	40	325	13,000	
	12.	Service laterals	support in place	3 between 7th/3rd	150	150	22,500	
	13.	Storm drain inlets	replace	7th to 3rd	18	2500	45,000	
		*Consolidate 6th and 5th St. sewers in new sewer routed down Townsend and 7th to Berry					Sewer Subtotal	12,157,000
Potable Water	1.	8" pipe	leave in place	7th to 3rd	3200	0	0	
	2.	18" stl. pipe	reroute around U-wall	xing @ Berry	200	250	50,000	
	3.	12" pipe	support in place	xing @ 4th	40	200	8,000	
	3.	8" pipe	support in place	xing @ 5th	40	150	6,000	
	4.	Service laterals	support in place	3 between 7th/3rd	150	100	15,000	
							Potable Water Subtotal	79,000
Auxiliary Water	1.	12" pipe	reroute around U-wall	xing @ Berry	200	225	45,000	
	2.	12" pipe	support in place	3: xing @ 6th, 5th, 4th	120	225	27,000	
							Auxiliary Water Subtotal	72,000
Gas	1.	16" CI pipe	relocate - north	4th to 3rd	900	500	450,000	
	2.	3" PL pipe	support in place	xing @ 4th	40	200	8,000	
	3.	1" PL pipe - laterals	support in place	2 between 5th/4th	80	150	12,000	
							Gas Subtotal	470,000
Electrical	1.	Medium RC box	replace		1	100000	100,000	
	2.	Large RC box	replace		1	500000	500,000	
	3.	Active conduit (3"/6")	relocate	7th to 3rd	1145	20	22,900	
	4.	Trench, joint (18"X40")	relocate	7th to 3rd	1145	40	45,800	
	5.	Overhead power poles	relocate	7th to 3rd	9	15000	135,000	
	6.	Streetlights/signals	replace	7th to 3rd	20	3800	76,000	
							Electrical Subtotal	879,700
Communications	1.	Small RC box (PacBell)	replace		4	5000	20,000	
	2.	Conduit (2"/4") (PacBell)	relocate	5th to 3rd	3800	10	38,000	
							Communications Subtotal	58,000
							Segment 1C Total	**13,715,700**

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Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 2A

Prepared by AGS, Inc
5/30/96

SEGMENT 2A: Begin Townsend St., End Bryant St. 3rd to Bryant: mined tunnel - long curve

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	relocate	2. xing @ 3rd	0	500	0	
	2.	Transition structures	new	for bypass @ 2nd St.	1	5000	15,000	
	3.	7.5' X 6' RC	Construct bypass in 2nd St.	access shaft	1000	750	750,000	
							Sewer Subtotal	765,000
Potable Water	1.	6"/8" pipe	support in place	access shaft	100	150	15,000	
							Potable Water Subtotal	15,000
Auxiliary Water	1.	16" pipe	support in place	access shaft	100	225	22,500	
	2.	8" lateral to hydrant	extend/support	xing @ 3rd	0	150	0	
							Auxiliary Water Subtotal	22,500
Gas	1.	4"/6" CI pipe	support in place	access shaft	100	300	30,000	
	2.	10" CI pipe	extend/support	xing @ 3rd	0	425	0	
							Gas Subtotal	30,000
Electrical	1.	Medium RC box	support	access shaft	2	100000	200,000	
	2.	Active conduit (3"/6")	relocate	access shaft	500	20	10,000	
	3.	Trench (18"X40")	relocate	access shaft	100	40	4,000	
	4.	Streetlights/signals	replace	access shaft	2	3800	7,600	
							Electrical Subtotal	221,600
Communications	1.	Small RC box (PacBell)	support	access shaft	2	5000	10,000	
	2.	Medium RC box (PacBell)	replace		0	20000	0	
	3.	Conduit (2"/4") (PacBell)	relocate	access shaft	300	10	3,000	
	4.	Trench (18"X40")	relocate	access shaft	100	40	4,000	
							Communications Subtotal	17,000
							Segment 2A Total	**1,071,100**

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 2B

Prepared by AGS, Inc
5/23/96

SEGMENT 2B: Begin Townsend St., End Bryant St. **3rd to Bryant: mined tunnel -medium curve**

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	relocate	2: xing @ 3rd	0	500	0	
	2.	Transition structures	new	for 3'X5' brick (2)	0	3000	0	
	3.	Storm drain inlets	replace	@ 3rd	0	2500	0	
							Sewer Subtotal	0
Potable Water	1.	6"/8" pipe	support in place	2: xing @ 3rd	0	150	0	
							Potable Water Subtotal	0
Auxiliary Water	1.	12" pipe	support in place	xing @ 3rd	0	225	0	
	2.	8" lateral to hydrant	extend/support	xing @ 3rd	0	150	0	
							Auxiliary Water Subtotal	0
Gas	1.	4"/6" CI pipe	support in place	2: xing @ 3rd	0	300	0	
	2.	10" CI pipe	extend/support	xing @ 3rd	0	425	0	
							Gas Subtotal	0
Electrical	1.	Medium RC box	replace		0	100000	0	
	2.	Active conduit (3"/6")	relocate	3rd	0	20	0	
	3.	Trench (18"X40")	relocate	3rd	0	40	0	
	4.	Streetlights/signals	replace	3rd	0	3800	0	
							Electrical Subtotal	0
Communications	1.	Small RC box (PacBell)	replace		0	5000	0	
	2.	Medium RC box (PacBell)	replace		0	200000	0	
	3.	Conduit (2"/4") (PacBell)	relocate	3rd	0	10	0	
	4.	Trench (18"X40")	relocate	3rd	0	40	0	
							Communications Subtotal	0
							Segment 2B Total	**0**

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 2C

Prepared by AGS, Inc
5/23/96

SEGMENT 2C: Begin Townsend St., End Bryant St. 3rd to Bryant: mined tunnel -short curve

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	relocate	2: xing @ 3rd	0	500	0	
	2.	Transition structures	new	for 3'X5' brick (2)	0	3000	0	
	3.	Storm drain inlets	replace	@ 3rd	0	2500	0	
							Sewer Subtotal	0
Potable Water	1.	6"/8" pipe	support in place	2: xing @ 3rd	0	150	0	
							Potable Water Subtotal	0
Auxiliary Water	1.	12" pipe	support in place	xing @ 3rd	0	225	0	
	2.	8" lateral to hydrant	extend/support	xing @ 3rd	0	150	0	
							Auxiliary Water Subtotal	0
Gas	1.	4"/6" CI pipe	support in place	2: xing @ 3rd	0	300	0	
	2.	10" CI pipe	extend/support	xing @ 3rd	0	425	0	
							Gas Subtotal	0
Electrical	1.	Medium RC box	replace		0	1000000	0	
	2.	Active conduit (3"/6")	relocate	3rd	0	20	0	
	3.	Trench (18"X40")	relocate	3rd	0	40	0	
	4.	Streetlights/signals	replace	3rd	0	3800	0	
							Electrical Subtotal	0
Communications	1.	Small RC box (PacBell)	replace		0	5000	0	
	2.	Medium RC box (PacBell)	replace		0	20000	0	
	3.	Conduit (2"/4") (PacBell)	relocate	3rd	0	10	0	
	4.	Trench (18"X40")	relocate	3rd	0	10	0	
							Communications Subtotal	0
							Segment 2C Total	**0**

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 3

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5/23/96

SEGMENT 3: Between 1st and 2nd, under Essex **Bryant between Folsom & Clementina: mined tunnel**

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	leave in place	xing @ Bryant	50	0	0	
							Sewer Subtotal	0
Potable Water							0	
							Potable Water Subtotal	0
Auxiliary Water							0	
							Auxiliary Water Subtotal	0
Gas							0	
							Gas Subtotal	0
Electrical	1.	230 kV tar-enamel line	leave in place	xing @ Harrison	50	0	0	
							Electrical Subtotal	0
Communications							0	
							Communications Subtotal	0
							Segment 3 Total	**0**

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 4

Prepared by AGS, Inc.
5/23/96

SEGMENT 4: Transbay Terminal Approach — Folsom between Natoma and Minna: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	replace/reroute/support	4: xing @ Clementina, Tehama, Howard, Natoma	320	500	160,000	
							Sewer Subtotal	160,000
Potable Water	1.	20" pipe	support in place	xing @ Folsom	80	300	24,000	
	2.	8" pipe	support in place	1: xing @ Howard	80	150	12,000	
	3.	4"/6" pipe	support in place	3: @ Clementina, Tehama, Natoma	240	125	30,000	
							Potable Water Subtotal	66,000
Auxiliary Water	2.	10"/12" pipe	support in place	3: xing @ Howard, 1st, Beale	240	225	54,000	
							Auxiliary Water Subtotal	54,000
Gas	1.	16" CI pipe	support in place	1: xing @ Beale	80	500	40,000	
	2.	12" CI pipe	support in place	xing @ Howard	80	450	36,000	
	3.	2"/4" PL pipe	support in place	6: xing @ Clementina, Tehama, Howard, Natoma	480	250	120,000	
							Gas Subtotal	196,000
Electrical	1.	Small RC box	replace		1	20000	20,000	
	2.	Medium RC box	replace		3	100000	300,000	
	3.	Large RC box	replace		2	500000	1,000,000	
	4.	Active conduit (3"/6")	support in place	xing between Folsom/Beale	8000	20	160,000	
							Electrical Subtotal	1,480,000
Communications	1.	Small RC boxes	replace		3	5000	15,000	
	2.	Conduit (2"/4")	support in place	xing between Folsom/Beale	5400	10	54,000	
							Communications Subtotal	69,000
							Segment 4 Total	**2,025,000**

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Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 5A

Prepared by AGS, Inc.
6/7/96

SEGMENT 5A: TBT Subway Station W/High Rise — Natoma to Beale: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	replace/reroute/support	xing @ 1st	80	500	40,000	
	2.	12" VCP	support in place	2: xing @ Fremont, Beale	160	250	40,000	
	3.	10" force main	support in place	Beale St.	1100	175	192,500	
	4.	12" X 14"	support in place	Minna St.	350	250	87,500	
	5.	12" VCP	support in place	Howard-Market	1070	250	267,500	
							Sewer Subtotal	627,500
Potable Water	1.	20" pipe	support in place	xing @ Folsom	80	300	24,000	
	2.	12" pipe	support in place	xing @ Beale	80	200	16,000	
	3.	8" pipe	support in place	2: xing @ 1st, Fremont	160	150	24,000	
	4.	4"/6" pipe	support in place	Natoma	500	125	62,500	
	5.	8" pipe	support in place	Minna	350	150	52,500	
							Potable Water Subtotal	179,000
Auxiliary Water	1.	10" pipe	support in place	xing @ 1st	80	200	16,000	
							Auxiliary Water Subtotal	16,000
Gas	1.	2"/4" PL pipe	support in place	3: xing @ Natoma, 1st, Fremont	240	250	60,000	
							Gas Subtotal	60,000
Electrical	1.	230 kV tar-enamel line	support in place		80	400	32,000	
	2.	Active conduit (3"/6")	support in place	xing between Natoma/Beale	1500	20	30,000	
	3.	Small RC Box	replace		9	20000	180,000	
	4.	Medium RC box	replace		8	100000	800,000	
							Electrical Subtotal	1,042,000
Communications	1.	Small RC boxes	replace		2	5000	10,000	
	2.	Conduit (2"/4")	support in place	xing between Natoma/Beale	1200	10	12,000	
							Communications Subtotal	22,000
							Segment 5A Total	**1,946,500**

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Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 5B

Prepared by AGS, Inc.
6/7/96

SEGMENT 5B: TBT Subway Station W/Short Bus Termi Natoma to Beale: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	replace/reroute/support	xing @ 1st	60	500	40,000	
	2.	12" VCP	support in place	2: xing @ Fremont, Beale	160	250	40,000	
	3.	10" force main	support in place	Beale St.	1100	175	192,500	
	4.	12" X 14"	support in place	Minna St.	350	250	87,500	
	5.	12" VCP	support in place	Howard-Market	1070	250	267,500	
							Sewer Subtotal	627,500
Potable Water	1.	20" pipe	support in place	xing @ Folsom	80	300	24,000	
	2.	12" pipe	support in place	xing @ Beale	80	200	16,000	
	3.	8" pipe	support in place	2: xing @ 1st, Fremont	160	150	24,000	
	4.	4"/6" pipe	support in place	Natoma	500	125	62,500	
	5.	8" pipe	support in place	Minna	350	150	52,500	
							Potable Water Subtotal	179,000
Auxiliary Water	1.	10" pipe	support in place	xing @ 1st	80	200	16,000	
							Auxiliary Water Subtotal	16,000
Gas	1.	2"/4" PL pipe	support in place	3: xing @ Natoma, 1st, Fremont	240	250	60,000	
							Gas Subtotal	60,000
Electrical	1.	230 kV tar-enamel line	support in place		80	400	32,000	
	2.	Small RC Box	replace		9	20000	180,000	
	3.	Medium RC box	replace		8	100000	800,000	
	4.	Active conduit (3"/6")	support in place	xing between Natoma/Beale	1500	20	30,000	
							Electrical Subtotal	1,042,000
Communications	1.	Small RC boxes	replace		2	5000	10,000	
	2.	Conduit (2"/4")	support in place	xing between Natoma/Beale	1200	10	12,000	
							Communications Subtotal	22,000
							Segment 5B Total	**1,946,500**

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Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment 5C

Prepared by AGS, Inc.
6/7/98

SEGMENT 5C: TBT Subway Station W/Medium Bus Ter Natoma to Beale: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	replace/reroute/support	xing @ 1st	80	500	40,000	
	2.	12" VCP	support in place	2: xing @ Fremont, Beale	160	250	40,000	
	3.	10" force main	support in place	Beale St.	1100	175	192,500	
	4.	12" X 14"	support in place	Minna St.	350	250	87,500	
	5.	12" VCP	support in place	Howard-Market	1070	250	267,500	
							Sewer Subtotal	627,500
Potable Water	1.	20" pipe	support in place	xing @ Folsom	80	300	24,000	
	2.	12" pipe	support in place	xing @ Beale	80	200	16,000	
	3.	8" pipe	support in place	2: xing @ 1st, Fremont	160	150	24,000	
	4.	4"/6" pipe	support in place	Natoma	500	125	62,500	
	5.	8" pipe	support in place	Minna	350	150	52,500	
							Potable Water Subtotal	179,000
Auxiliary Water	1.	10" pipe	support in place	xing @ 1st	80	200	16,000	
							Auxiliary Water Subtotal	16,000
Gas	1.	2"/4" PL pipe	support in place	3: xing @ Natoma, 1st, Fremont	240	250	60,000	
							Gas Subtotal	60,000
Electrical	1.	230 kV tar-enamel line	support in place		80	400	32,000	
	2.	Active conduit (3"/6")	support in place	xing between Natoma/Beale	1500	20	30,000	
	3.	Small RC Box	replace		9	20000	180,000	
	4.	Medium RC box	replace		8	100000	800,000	
							Electrical Subtotal	1,042,000
Communications	1.	Small RC boxes	replace		2	5000	10,000	
	2.	Conduit (2"/4")	support in place	xing between Natoma/Beale	1200	10	12,000	
							Communications Subtotal	22,000
							Segment 5C Total	**1,946,500**

= $1881/LF

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment PS

Prepared bY AGS, Inc.
6/7/96

SEGMENT PS: Pedestrian Subway to Market St. Mission to Market: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3.5 X 5.3 concrete	support in place	xing @ Mission	40	800	32,000	
	2.	3 X 4.5 concrete	support in place	xing @ Mission	40	800	32,000	
	3.	Sewer Laterals	support in place	5: between Howard - Market	5	150	750	
	4.	Junction structure	replace	xing @ Mission	1	3000	3,000	
							Sewer Subtotal	67,750
Potable Water	1.	12" pipe	relocate	Howard to Market	1100	200	220,000	
	2.	12" pipe	support in place	xing @ Mission	60	200	12,000	
							Potable Water Subtotal	232,000
Auxiliary Water	1.	10" pipe	relocate	Howard to Market	1100	200	220,000	
	2.	12" pipe	support in place	xing @ Mission	80	225	18,000	
	3.	8" lateral to hydrant	relocate	2: Beale	2	150	300	
							Auxiliary Water Subtotal	238,300
Gas	1.	16" CI pipe	relocate	Howard to Market	1100	500	550,000	
	2.	8" CI pipe	support in place	xing @ Mission	30	400	12,000	
	3.	3" PL pipe	support in place	xing @ Mission	30	200	6,000	
	4.	1" PL pipe - laterals	relocate	3: between Howard/Market	3	150	450	
							Gas Subtotal	568,450
Electrical	1.	Small RC box	replace		2	20000	40,000	
	2.	Active conduit (3"/6")	support in place	Beale to Market	12000	20	240,000	
							Electrical Subtotal	280,000
Communications	1.	Small RC boxes	replace		2	5000	10,000	
	2.	Medium RC box	replace		2	20000	40,000	
	3.	Conduit (2"/4")	relocate	Beale: Howard to Market	18400	10	184,000	
							Communications Subtotal	234,000
							Segment PS Total	**1,620,500**

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Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment SW3-A

Prepared by AGS, Inc.
5/30/96

SEGMENT SW3-A: Satellite Storage Yard (16th St./Owens) 16th to Berry: at-grade

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	66" force main	leave in place	16th to Berry	2300	0	0	
	2.	8" VCP	reinforce/sleeve	xing near 16th	270	200	54,000	
							Sewer Subtotal	54,000
Potable Water	1.	12" pipe	reinforce/sleeve	xing @ Hooper	270	250	67,500	
							Potable Water Subtotal	67,500
Auxiliary Water								
							Auxiliary Water Subtotal	0
Gas								
							Gas Subtotal	0
Electrical								
							Electrical Subtotal	0
Communications								
							Communications Subtotal	0
							Segment SW3 Total	**121,500**

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SEGMENT SW3-B: Satellite Storage Yard (16th St./Owens) 16th to Berry: at-grade

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	66" force main	leave in place	16th to Berry	2300	0	0	
	2.	8" VCP	reinforce/sleeve	xing near 16th	270	200	54,000	
							Sewer Subtotal	54,000
Potable Water	1.	12" pipe	reinforce/sleeve	xing @ Hooper	270	250	67,500	
							Potable Water Subtotal	67,500
Auxiliary Water								
							Auxiliary Water Subtotal	0
Gas								
							Gas Subtotal	0
Electrical								
							Electrical Subtotal	0
Communications								
							Communications Subtotal	0
							Segment SW3-B Total	**121,500**

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Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment SW3-C

Prepared by AGS, Inc.
5/30/96

SEGMENT SW3-C: Satellite Storage Yard (16th St./Owens) 16th to Berry: at-grade

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	66" force main	leave in place	16th to Berry	2300	0	0	
	2.	8" VCP	reinforce/sleeve	xing near 16th	270	200	54,000	
							Sewer Subtotal	54,000
Potable Water	1.	12" pipe	reinforce/sleeve	xing @ Hooper	270	250	67,500	
							Potable Water Subtotal	67,500
Auxiliary Water								
							Auxiliary Water Subtotal	0
Gas								
							Gas Subtotal	0
Electrical								
							Electrical Subtotal	0
Communications								
							Communications Subtotal	0
							Segment SW3-C Total	**121,500**

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SEGMENT TW: Satellite Storage Yard (Townsend St) Berry to Fifth: at-grade

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	10' X 7' RC	reinforce	Xing @ Sixth	250	70	17,500	
	2.	6' RC	reinforce	Xing @ Sixth	250	50	12,500	
	3.	9' X 7' RC	reinforce/sleeve	Xing @ Fifth	40	200	8,000	
							Sewer Subtotal	38,000
Potable Water	1.	12" pipe	reinforce/sleeve	xing @ Berry	270	80	21,600	
	2.	8" pipe	reinforce/sleeve	Xing @ Fifth	40	70	2,800	
							Potable Water Subtotal	24,400
Auxiliary Water	1.	12" pipe	reinforce/sleeve	Xing @ Sixth	250	80	20,000	
	2.	12" pipe	reinforce/sleeve	Xing @ Fifth	40	80	3,200	
							Auxiliary Water Subtotal	23,200
Gas								
							Gas Subtotal	0
Electrical								
							Electrical Subtotal	0
Communications								
							Communications Subtotal	0
							Segment TW Total	**85,600**

UTILITY	ITEM	UNIT COST
Sewer	8" VCP	200
	12" VCP	250
	15" VCP	275
	18" VCP	300
	21" VCP	325
	24" VCP	350
	10" force main	175
	30" force main	350
	3' X 5' brick	500
	Transition structure (for 3'X5')	3,000
	Service laterals (per foot)	150
	Service laterals (unit)	1,000
	Storm drain inlets	2,500
Potable Water	2" DI	75
	4" DI	100
	6" DI	125
	8" DI	150
	12" DI	200
	18" steel	250
	20" steel	300
	Service laterals (per foot)	100
	Service laterals (unit)	1,000
Auxiliary Water	10" DI	200
	12" DI	225
	14" DI	250
	16" steel	275
	20" steel	325
	8" lateral to hydrant	150
	5' dia. concrete (lower)	600
	35' X 24' cistern	400,000
Gas	1"/2" PL	150
	3" PL	200
	4" PL	250
	6" PL	300
	8" CI	400
	10" CI	425
	12" CI	450
	16" CI	500
Electrical	Small RC box	20,000
	Medium RC box	100,000
	Large RC box	500,000
	Active conduit (3"/6")	20

	Trench (18"X40")	40
	Overhead power pole	15,000
	Streetlight	3,800
	Traffic signal	
	230 kV tar-enamel line	400
Communications	Small RC box	5,000
	Medium RC box	20,000
	Large RC box	100,000
	Conduit (2"/4")	10
	Trench (18"X40")	40

REPORT S1 - ESTIMATE SUMMARY BY FACILITY

WORK BREAKDWN FACIL.STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
01A0	1A - STREET RESTORATION	9604	16561	7230	1953	1469816	0	83203	1578763
01B0	1B - STREET RESTORATION	5637	10092	4019	1660	804729	0	46047	866547
01C0	1C - STREET RESTORATION	8214	11410	5069	1263	1242186	0	68827	1328755
04X0	4 - STREET RESTORATION	1452	1672	789	143	230371	0	12518	245493
05A0	5A - STREET RESTORATION	2923	3774	1784	286	462407	0	25372	493623
05B0	5B - STREET RESTORATION	2923	3774	1784	286	462407	0	25372	493623
05P0	PED SUBWAY - STREET RESTORATION	2547	4578	2094	432	419690	0	23697	450491

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
01A0	1A - STREET RESTORATION									
01A0 .0214229.	TRAFFIC CONTROL	3550 LF	2095	0	0	0	72775	0	3639	76414
01A0 .0225001.	PREPARE SUBGRADE	22500 SY	248	10650	5715	0	0	0	6546	22911
01A0 .0268004.	STORM DRAINAGE	3500 LF	1155	0	0	0	131600	0	6580	138180
01A0 .0282456.	AC PAVING INCL AGG BASE	15135 SY	1332	0	0	0	681075	0	34054	715129
01A0 .0282457.	MAINT, PATCHING, OVERLAY FOR TRANSITIONS OF PAVEMENT NOT DEMOLISHED	3550 LF	320	0	0	0	177500	0	8875	186375
01A0 .0287351.	6" X 8" CONC CURB & GUTTER	9450 LF	1418	0	0	0	189000	0	9450	198450
01A0 .0287361.	6" CONC SIDEWALK	52880 SF	2856	0	0	0	217866	0	10893	228759
01A0 .0289814.	STRIPING - 4" WIDE	15000 LF	180	5911	1515	1953	0	0	3166	12545
TOTAL	1A - STREET RESTORATION		9,604	16,561	7,230	1,953	1,469,816	0	83,203	1,578,763
01B0	1B - STREET RESTORATION									
01B0 .0214229.	TRAFFIC CONTROL	2500 LF	1475	0	0	0	51250	0	2563	53813
01B0 .0225001.	PREPARE SUBGRADE	10750 SY	118	5067	2731	0	0	0	3119	10917
01B0 .0268004.	STORM DRAINAGE	2350 LF	776	0	0	0	88360	0	4418	92778
01B0 .0282456.	AC PAVING INCL AGG BASE	7425 SY	653	0	0	0	334125	0	16706	350831
01B0 .0282457.	MAINT, PATCHING, OVERLAY FOR TRANSITIONS OF PAVEMENT NOT DEMOLISHED	2500 LF	225	0	0	0	125000	0	6250	131250
01B0 .0287351.	6" X 8" CONC CURB & GUTTER	4130 LF	620	0	0	0	82600	0	4130	86730
01B0 .0287361.	6" CONC SIDEWALK	29950 SF	1617	0	0	0	123394	0	6170	129564
01B0 .0289814.	STRIPING - 4" WIDE	12750 LF	153	5025	1288	1660	0	0	2691	10664
TOTAL	1B - STREET RESTORATION		5,637	10,092	4,019	1,660	804,729	0	46,047	866,547
01C0	1C - STREET RESTORATION									
01C0 .0214229.	TRAFFIC CONTROL	4480 LF	2643	0	0	0	91840	0	4592	96432
01C0 .0225001.	PREPARE SUBGRADE	16100 SY	177	7601	4089	0	0	0	4676	16366
01C0 .0268004.	STORM DRAINAGE	4480 LF	1478	0	0	0	168448	0	8422	176870
01C0 .0282456.	AC PAVING INCL AGG BASE	12100 SY	1065	0	0	0	544500	0	27225	571725
01C0 .0282457.	MAINT, PATCHING, OVERLAY FOR TRANSITIONS OF PAVEMENT NOT DEMOLISHED	4480 LF	403	0	0	0	224000	0	11200	235200
01C0 .0287351.	6" X 8" CONC CURB & GUTTER	4150 LF	623	0	0	0	83000	0	4150	87150
01C0 .0287361.	6" CONC SIDEWALK	31650 SF	1709	0	0	0	130398	0	6520	136918
01C0 .0289814.	STRIPING - 4" WIDE	9700 LF	116	3809	980	1263	0	0	2042	8094
TOTAL	1C - STREET RESTORATION		8,214	11,410	5,069	1,263	1,242,186	0	68,827	1,328,755
04X0	4 - STREET RESTORATION									

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
04X0 .0214229.	TRAFFIC CONTROL	600 LF	354	0	0	0	12300	0	615	12915
04X0 .0225001.	PREPARE SUBGRADE	2670 SY	29	1245	678	0	0	0	769	2692
04X0 .0268004.	STORM DRAINAGE	600 LF	198	0	0	0	22560	0	1128	23688
04X0 .0282456.	AC PAVING INCL AGG BASE	2475 SY	218	0	0	0	111375	0	5569	116944
04X0 .0282457.	MAINT, PATCHING, OVERLAY FOR TRANSITIONS OF PAVEMENT NOT DEMOLISHED	600 LF	54	0	0	0	30000	0	1500	31500
04X0 .0287351.	6" X 8" CONC CURB & GUTTER	1100 LF	165	0	0	0	22000	0	1100	23100
04X0 .0287361.	6" CONC SIDEWALK	7800 SF	421	0	0	0	32136	0	1607	33743
04X0 .0289814.	STRIPING - 4" WIDE	1100 LF	13	427	111	143	0	0	230	911
TOTAL	4 - STREET RESTORATION		1,452		789		230,371		12,518	
				1,672		143		0		245,493
05A0	5A - STREET RESTORATION									
05A0 .0214229.	TRAFFIC CONTROL	1325 LF	782	0	0	0	27163	0	1358	28521
05A0 .0225001.	PREPARE SUBGRADE	6150 SY	68	2920	1562	0	0	0	1793	6275
05A0 .0268004.	STORM DRAINAGE	1325 LF	437	0	0	0	49820	0	2491	52311
05A0 .0282456.	AC PAVING INCL AGG BASE	4300 SY	378	0	0	0	193500	0	9675	203175
05A0 .0282457.	MAINT, PATCHING, OVERLAY FOR TRANSITIONS OF PAVEMENT NOT DEMOLISHED	1950 LF	176	0	0	0	97500	0	4875	102375
05A0 .0287351.	6" X 8" CONC CURB & GUTTER	1625 LF	244	0	0	0	32500	0	1625	34125
05A0 .0287361.	6" CONC SIDEWALK	15030 SF	812	0	0	0	61924	0	3096	65020
05A0 .0289814.	STRIPING - 4" WIDE	2200 LF	26	854	222	286	0	0	459	1821
TOTAL	5A - STREET RESTORATION		2,923		1,784		462,407		25,372	
				3,774		286		0		493,623
05B0	5B - STREET RESTORATION									
05B0 .0214229.	TRAFFIC CONTROL	1325 LF	782	0	0	0	27163	0	1358	28521
05B0 .0225001.	PREPARE SUBGRADE	6150 SY	68	2920	1562	0	0	0	1793	6275
05B0 .0268004.	STORM DRAINAGE	1325 LF	437	0	0	0	49820	0	2491	52311
05B0 .0282456.	AC PAVING INCL AGG BASE	4300 SY	378	0	0	0	193500	0	9675	203175
05B0 .0282457.	MAINT, PATCHING, OVERLAY FOR TRANSITIONS OF PAVEMENT NOT DEMOLISHED	1950 LF	176	0	0	0	97500	0	4875	102375
05B0 .0287351.	6" X 8" CONC CURB & GUTTER	1625 LF	244	0	0	0	32500	0	1625	34125
05B0 .0287361.	6" CONC SIDEWALK	15030 SF	812	0	0	0	61924	0	3096	65020
05B0 .0289814.	STRIPING - 4" WIDE	2200 LF	26	854	222	286	0	0	459	1821
TOTAL	5B - STREET RESTORATION		2,923		1,784		462,407		25,372	
				3,774		286		0		493,623
05P0	PED SUBWAY - STREET RESTORATION									
05P0 .0214229.	TRAFFIC CONTROL	830 LF	490	0	0	0	17015	0	851	17866
05P0 .0225001.	PREPARE SUBGRADE	6925 SY	76	3264	1759	0	0	0	2009	7032

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
05P0 .0268004.	STORM DRAINAGE	830 LF	274	0	0	0	31208	0	1560	32768
05P0 .0282456.	AC PAVING INCL AGG BASE	5075 SY	447	0	0	0	228375	0	11419	239794
05P0 .0282457.	MAINT, PATCHING, OVERLAY FOR TRANSITIONS OF PAVEMENT NOT DEMOLISHED	830 LF	75	0	0	0	41500	0	2075	43575
05P0 .0287351.	6" X 8" CONC CURB & GUTTER	1660 LF	249	0	0	0	33200	0	1660	34860
05P0 .0287361.	6" CONC SIDEWALK	16600 SF	896	0	0	0	68392	0	3420	71812
05P0 .0289814.	STRIPING - 4" WIDE	3320 LF	40	1314	335	432	0	0	703	2784
TOTAL	PED SUBWAY - STREET RESTORATION		2,547		2,094		419,690		23,697	
				4,578		432		0		450,491

3. Conventional underpinning schemes involving deep mined pits/piers, jacked piles or pin piles are difficult, risky and very costly. Installation of any of these types of new foundations carries a significant risk that the underpinning process would cause damage to the buildings. The difficulties with underpinning for this project are in part due to the large span over which the structural loads will have to be transferred so that the new foundations are outside the zone of influence of tunneling.

4. Assuming that the risk associated with cave-ins due to tunnel collapse is managed through improved tunneling techniques the simplest and most economical underpinning method would be to install a jacking system (passive underpinning) that allows periodic lifting of the buildings to compensate for settlements caused by tunneling. Inherent in this approach is a comprehensive monitoring program and development of threshold limits of settlement, which would trigger the lifting process. For details of this option please reefer to Appendix C.

5. If the intent of the underpinning work is to provide an extra measure of safety in the event that a cave-in occurs, then conventional underpinning by transferring the structure loads to new, deep foundations that derive their support from beyond the zone of influence of tunneling, would be required. An example of this type of underpinning is shown on Plate 9. It must be recognized that the system shown on Plate 9 assumes that caving, if it were to occur, would be a localized incident, involving only a portion of the tunnel. If the intent was to safeguard against a case of major collapse involving the entire tunnel cavity, then a system much more robust than the one shown on Plate 9 would be required. However, in view of the ground reinforcement and incremental excavation planned for the CalTrain tunnels the system shown on Plate 9 is considered as a satisfactory precaution.

6. The costs associated with underpinning vary considerably between the three proposed routes. The lowest cost is associated with the "short radius" tunnel because it involves the fewest buildings. The highest cost is associated with the "long radius" tunnel because it would affect the largest number of buildings. Costs

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ESTIMATING SERVICES

CALTRAIN S.F. DOWNTOWN EXTENSION

SAN FRANCISCO CALIFORNIA

UNDERPINNING OF EXISTING HISTORIC BUILDINGS

REPORT PREPARED
BY
WERNER & ASSOCIATES
FOR DAMES & MOORE

WERNER AND ASSOCIATES
CONSULTING ENGINEERS CONSTRUCTION PERFORMANCE SERVICES
3706 MT. DIABLO BLVD., LAFAYETTE, CA. 94549 Ph:(510) 284-2968 Fax: -2782

MAY 1996

We envision that this zone of possible disturbed ground mass rises from each bottom corner of excavation at a slope of 1H:2½V to top of tunnel, where it goes vertical to the ground surface This is the zone which determines the extent of underpinning work to be undertaken within existing buildings.

3.5 ZONE OF "NO-LOAD" FOR U/P PILES

The plane which defines the soil mass into which piles should be founded starts at the same bottom corners of excavation. From there it goes horizontal for 5' and then rises on a 1H:1V in each direction. We estimate that these small diameter, but pressure grouted piles will need to be extended about 20' below this plane on the average for a pile capacity of 100K±.

4. ESTIMATED COSTS

4.1 UNDERPINNING COST ESTIMATE

We have performed a couple of cost models for a few typical buildings, and our cursory analysis indicates that the unit cost of the two underpinning schemes can be calculated at $1200± and $2000± per linear foot of tunnel (max dimension) within the confines of the structure for control and micro/mini pile underpinning, respectively.

We assumed an average building covered 120LF of tunnel. We arrived at these costs in the following manner:

4.1.1 CONTROL PIER UNDERPINNING & COLUMN PICK-UP

For this average building, we assumed we needed 25 control piers @ 3'x5'x 4' = 2.5 CY/pier.

We estimate the equivalent cost of all the work associated with the installation of the control piers @ $500/CY. Hence, for each pier we estimated as follows:

Install - 2.5 CY x $500	=	$ 1,250.00
Monitor & Jack (3 wks)	=	750.00
Shim, grout, decommission	=	1,500.00
TOTAL		$ 3,500.00/pier

We assumed we had 8 column pick-ups, with the following unit costs:

Install at each column	=	$ 1,500.00
Monitor & jack	=	1,000.00
Shim, grout, decommission	=	1,500.00
TOTAL		$ 4,000.00/column

Thus, 25 @ $ 3,500.00	=	$ 87,500.00
8 @ $ 4,000.00	=	32,000.00
TOTAL		$120,000.00±

Thus, the cost per LF = $120,000/120' = $ 1,000/LF

Allow 20% for mark-up
1.2 X $1.OK = $ 1,200/LF (of tunnel)

5/18/96
BCC

4.1.2 MINI/MICRO PILE UNDERPINNING

For the average 120'LF of tunnel building, we estimated:

60CY of grade beams @ $750/CY	=	$ 45,000.00
80CY of pick-up beams @ $650/CY	=	52,000.00
50CY of misc. concrete @ $500/CY	=	25,000.00
30 Mini piles @ $2,500 as installed	=	75,000.00
TOTAL		$200,000.00

Final unit cost (200,000/120)1.2 = $2,000/LF

4.2 TOTAL UNDERPINNING COST

We have estimated the approximate linear footage for each of the three tunnel route alternatives at 500LF, 800LF, and 1250LF for short, medium and long, respectively.

Accordingly, the cost of underpinning can vary from a low of $600,000 to a high of $2,500,000 for the two extreme uses of control underpinning with the short radius tunnel route and micro/mini pile underpinning in combination with the long radius tunnel route, respectively.

TABLE I - TOTAL UNDERPINNING COST

ROUTE	CONTROL TYPE UNDERPINNING	MICRO/MINI PILE UNDERPINNING
Short Radius	$ 600,000	$1,000,000
Medium Radius	$ 960,000	$1,600,000
Long Radius	$1,500,000	$2,500,000

USE

Respectfully submitted,

Ulf H. Werner, C.E. & G.E.

range from $0.6 million to $1.5 million for "control type" underpinning and from $1.0 million to $2.5 million for conventional underpinning.

7. The Werner & Associates report concludes that underpinning is not required north of Brannan Street because of the deeper soil and rock cover in this area. However, it must be recognized that the 355 Bryant Street building has been recently seismically upgraded, including rock anchors for uplift load resistance. Although at this time details of the retrofit design are not available, it must be recognized that special measures may be required to avoid interference with the existing foundation support system. It will be necessary to make an allowance in the cost estimate for potential redesign of the seismic uplift resistance of this building.

SAY $200,000

5.0 CONCLUSIONS AND RECOMMENDATIONS

The results of the special studies for the CalTrain tunnels in the area of the historic buildings between Townsend and Bryant Streets leads to the following conclusions and recommendations.

1. Tunneling through Franciscan rock, even with the new deeper profiles shown on Plates 3 and 4, is considered to be "difficult and hazardous" according to accepted tunnel classification systems. In order to manage the risks associated with tunneling a comprehensive system of ground improvement and dewatering, in combination with very careful tunneling methods and perhaps underpinning, will be required.

2. Three different tunneling methods have been identified as technically feasible and economically attractive for constructing the proposed tunnels. All three methods will involve extensive ground strengthening to protect against potential cave-ins, and dewatering to control groundwater. The tunneling costs for the three methods identified in the study are quite similar, ranging from $13,000 to $14,000 per lineal

ICF KAISER ENGINEERS, INC.
SAN FRANCISCO, CALIFORNIA
JOB NO. 65928-005-05

ICF KAISER ENGINEERS INTERACTIVE ESTIMATING
CALTRAIN DOWNTOWN EXTENSION

REPORT D1 - ESTIMATE DETAIL BY FACILITY

DATE: 05/21/96 14:19
BY BCC/RLM/HWH

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG		DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
181		HAZARDOUS WASTE DISPOSAL									
MB NORTH 181	.0220251.	HAUL & DISPOSE OF HAZARDOUS WASTE FROM SUBSURF PARKING BUS TERM ALT MB NORTH	28730 CY	0	0	0	0	2442050	0	122103	2564153
SEG 5 181	.0220252.	HAUL & DISPOSE OF HAZARDOUS WASTE FROM TRANSBAY TERM SUBWAY STATION	18100 CY	0	0	0	0	1538500	0	76925	1615425
TOTAL		HAZARDOUS WASTE DISPOSAL		0	0	0	0	3,980,550	0	199,028	4,179,578
REPORT TOTAL				0	0	0	0	3,980,550	0	199,028	4,179,578

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
182	LANDSCAPING									
1821	1A - MISSION BAY STATION									
1821 .0295001.	PLANTER W/TREE	44 EA	88	0	0	0	24200	0	1210	25410
TOTAL	1A - MISSION BAT STATION		88	0	0	0	24,200	0	1,210	25,410
1822	1B - MISSION BAY STATION									
1822 .0295001.	PLANTER W/TREE	22 EA	44	0	0	0	12100	0	605	12705
1822 .0295002.	HEDGE	680 LF	61	0	0	0	3400	0	170	3570
TOTAL	1B - MISSION BAY STATION		105	0	0	0	15,500	0	775	16,275
TOTAL	LANDSCAPING		193	0	0	0	39,700	0	1,985	41,685
REPORT TOTAL			193	0	0	0	39,700	0	1,985	41,685

MITIGATION

Ben CAVIN

OFFICE MEMORANDUM
SAN FRANCISCO • OAKLAND • BEDM

ACTION	INFO	
To: Dave Minister, ICF Kaiser	Dale Shileikis, Dames & Moore Davis Mansen, De Leuw, Cather	**Date:** September 15, 1995 **File:** 30752-003

From: Mark G. Filippini, CEG MGF

Subject: CalTrain Corridor Study, Amendment 2 Supplemental Hazardous Materials Evaluation

This memorandum presents our preliminary evaluation of the impacts of hazardous materials on the additional CalTrain relocation alternatives 2D and 2E per Amendment 2 of our contract. The additional alternatives include the widening of the underground portion of the train terminal to include an approximate additional 80 feet of the block immediately east of Beale Street between Mission and Folsom streets. This would bring the total width of the terminal to approximately 160 feet. The depth of the excavation would be approximately 55 feet. You have asked that we evaluate the impacts of the proposed terminal with respect to the quantity of hazardous materials that could be encountered in the excavation and both unit and total costs to remove and dispose of the material.

Our preliminary evaluations presented in our August 1 memo and our draft Setting Section identified the area near the intersection of Beale and Howard streets as an area known to contain significant quantities of PNA-containing soil. The sources of the PNA's was a coal gasification plant that existed near Fremont and Howard streets that generated coal tar as a byproduct during the turn of the century. The coal tar was discharged directly into the Bay at Yerba Buena Cove along what is now Howard and Beale streets. Yerba Buena cove was later filled as reclaimed land. Coal tar is known to exist on top of the old Bay Mud deposits along Beale Street from approximately Mission to Folsom streets. It is believed to extend as far west as Fremont Street and as far east as the Embarcadero. The San Francisco Muni Metro Turnaround project at the end of Howard Street at the Embarcadero has encountered significant quantities of the coal tar residue as have the existing and proposed high-rises on the corner of Howard and Beale. The thickness of the deposits diminishes to near nothing along its fringes and are found at thicknesses up to 7 to 10 feet in the area of Beale and Howard streets. The approximate depth to the top of the deposits is 10 to 12 feet at Beale Street, shallowing to the west and deepening to the east.

In calculating the potential quantities of the contaminated soil, we judged the thickest portion of the material to be 10 feet, diminishing to 0 feet near Fremont and Mission streets giving an average thickness of 5 feet. Although not much field control exists to the north and south of Howard Street, we assumed the zone of contamination extends from 200 feet north of Folsom to 200 feet south of Mission Street, resulting in an 800 foot portion of the alignment being affected. Applying an average thickness of 5 feet results in the following cubic yardage calculation:

800' x 160' x 5' = 640,000 cubic feet / 27 cf per cy = 24,000 cubic yards

Dames & Moore contacted several disposal facilities and found the most favorable price for disposal of the material to be out of state in Utah, where the material would avoid the disposal costs associated with being a California hazardous waste. The estimated cost for transportation, disposal, and taxes for the large quantities estimated was $85 per cubic yard. The estimated resulting cost is $2,040,000.

USE $85/CY

Previous analysis has indicated the material to not be a Federal RCRA hazardous waste. Disposal of the material as either a California State or RCRA hazardous waste could result in significant costs increases up to approximately $250 per cubic yard. Changes in the classification of the material, availability of out of state facilities, and unit disposal costs between now and the time of disposal could significantly affect these estimates. The actual distribution, extent, and thickness of the contaminated soil is likely hydrogenous and varies considerably in the field. Therefore design and contractor specifications should be structured accordingly. Alternatively, field investigations of actual conditions along the alignment could greatly reduce the error factors in these estimates.

I hope this provides you with the information you require at this time. if you have any questions please contact me at (415) 243-3729.

ICF KAISER

CALTRAIN DOWNTOWN EXTENSION PROJECT

SAN FRANCISCO, CALIFORNIA

SEGMENT TRACKWAY & SUBWAY FACTORS

	STRUCT WIDTH FACTOR	SHORING WALL HGT FACTOR	ENVIR SENSITIVE FACTOR	PILING FACTOR	VENT SHAFT FACTOR	MISC FACTOR	TOTAL FACTOR
SEGMENT #1A							
TRACKWAY AT GRADE	1	1	1	1	1	1	1
TRACKWAY RETAINED CUT	1	0.85	1	1	1	1	0.85
CUT & COVER SOILCEM 2-TRACK	1	1.1	1.05	1	1.01	1	1.17
SEGMENT #1B							
TRACKWAY AT GRADE	1	1	1	1	1	1	1
TRACKWAY RETAINED CUT	1	0.85	1	1	1	1	0.85
CUT & COVER SOILCEM 2-TRACK	1	1.21	1.05	1	1.01	1	1.28
SEGMENT #1C							
TRACKWAY AT GRADE	1	1	1	1	1	1	1
TRACKWAY RETAINED CUT	1	0.85	1	1	1	1	0.85
CUT & COVER SOILCEM 2-TRACK	1	1.1	1.01	1	1.01	0.97	1.09
SEGMENT #2A							
MINED TUNNEL 2-TRACK	1	1	1	1	1.04	1	1.04
SEGMENT #2B							
MINED TUNNEL 2-TRACK	1	1	1	1	1.03	0.95	0.98
SEGMENT #2C							
MINED TUNNEL 2-TRACK	1	1	1	1	1.03	0.93	0.96
SEGMENT #3							
MINED TUNNEL 2-TRACK	1	1	1	1	1.03	0.88	0.91
SEGMENT #4							
CUT & COVER SPTC 6-TRACK							
SEGMENT #5A							
SHORED EXCAV 6-TRACK							

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CALTRAIN DOWNTOWN EXTENSION PROJECT

SAN FRANCISCO, CALIFORNIA

SEGMENT TRACKWAY & SUBWAY FACTORS

	STRUCT WIDTH FACTOR	SHORING WALL HGT FACTOR	ENVIR SENSITIVE FACTOR	PILING FACTOR	VENT SHAFT FACTOR	MISC FACTOR	TOTAL FACTOR
SEGMENT #5B							
SHORED EXCAV 6-TRACK							
SEGMENT #5C							
SHORED EXCAV 6-TRACK							

REPORT S1 - ESTIMATE SUMMARY BY FACILITY

WORK BREAKDWN FACIL.STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
04A0	SEGMENT 4								
04A0 .00	FACILITY DESCRIPTION ONLY	0	0	0	0	0	0	0	0
04A0 .02	SITEWORK	83308	2390312	1257457	960860	7413853	0	1925887	13948369
04A0 .03	CONCRETE	154034	6423216	776784	5655438	0	0	3213861	16069299
04A0 .05	METALS	20040	859037	156678	2174340	0	0	797514	3987569
04A0 .07	THERMAL & MOISTURE PROTECTION	8750	287350	5425	248546	0	0	135330	676651
04A0 .15	MECHANICAL	717	0	0	0	342340	0	17117	359457
04A0 .16	ELECTRICAL	1792	0	0	0	179160	0	8958	188118
TOTAL	SEGMENT 4	268,641	9,959,915	2,196,344	9,039,184	7,935,353	0	6,098,667	35,229,463

9700 ft @ 35,585/LF

REPORT D1 - ESTIMATE DETAIL BY FACILITY

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
04A0	SEGMENT 4									
04A0 .00	FACILITY DESCRIPTION ONLY									
04A0 .0000009.	CUT & COVER - 6 TRACKS 990' LONG BETWEEN MINED TUNNEL & TB SUBWAY STA	1 LS	0	0	0	0	0	0	0	0
TOTAL	FACILITY DESCRIPTION ONLY		0	0	0	0	0	0	0	0
04A0 .02	SITEWORK									
04A0 .0214100.	SAW CUT ROAD PAVEMENT	1240 LF	149	4924	1016	6564	0	0	3032	15536
04A0 .0214105.	REMOVE ROAD & PARKING PAVEMENT	2475 SY	495	18921	3203	0	0	0	8850	30974
04A0 .0214220.	TRAFFIC MAINTENANCE (TYP)	450 RF	2250	0	0	0	81815	0	4091	85906
04A0 .0214515.	STREET DECKING W/STEEL GIRDER AND TIMBER	2475 SY	7333	317498	59967	228257	191441	0	183384	980547
04A0 .0214632.	REMOVE CONCRETE GUIDE WALLS	4040 LF	0	0	0	0	367276	0	18364	385640
04A0 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	1795 CY	0	0	0	0	114234	0	5712	119946
04A0 .0220228.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	135000 SF	17550	0	0	0	2970000	0	148500	3118500
04A0 .0220241.	HAUL TO DUMP - EXCAV MAT'L	177500 CY	17750	657105	719585	0	528063	0	577079	2481832
04A0 .0220242.	DUMP FEE	177500 CY	0	0	0	0	2130000	0	106500	2236500
04A0 .0220332.	COMPACTED FILL	62480 CY	9372	331568	50703	726039	0	0	225512	1333822
04A0 .0221109.	DEWATERING	990 RF	0	0	0	0	360004	0	18000	378004
04A0 .0221120.	EXCAV MASS-2CY CLAMSHELL	177500 CY	23075	1060296	422983	0	0	0	593312	2076591
04A0 .0233813.	14" X 14" PRECAST PILE	25400 LF	5334	0	0	0	591820	0	29591	621411
04A0 .0267250.	INSTRUMENTATION	990 RF	0	0	0	0	79200	0	3960	83160
TOTAL	SITEWORK		83,308	1,257,457		7,413,853		1,925,887		
				2,390,312		960,860		0		13,948,369
04A0 .03	CONCRETE									
04A0 .0310100.	FORMS - GENERAL	187400 SF	39354	1764109	37667	180963	0	0	495685	2478424
04A0 .0313206.	NEOPRENE WATERSTOPS,DB, 6"	2250 LF	203	9100	194	12665	0	0	5490	27449
04A0 .0332300.	REBAR - GENERAL	9712950 LB	77704	3283318	565002	2740023	0	0	1647086	8235429
04A0 .0344302.	CONCRETE - SOG & LOW PLATFORM	17700 CY	10620	387913	12585	1305906	0	0	426601	2133005
04A0 .0344830.	CONCRETE - SUPPORTED SLAB AND BEAMS	13270 CY	13270	496630	81863	921469	0	0	374991	1874953
04A0 .0354400.	CONCRETE - EXTERIOR WALLS	6135 CY	10736	401795	66227	426014	0	0	223509	1117545
04A0 .0364103.	CONCRETE (4000 PSI) - COLUMNS	985 CY	2147	80351	13246	68398	0	0	40499	202494

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
TOTAL	CONCRETE		154,034		776,784		0		3,213,861	
				6,423,216		5,655,438		0		16,069,299
04A0 .05	METALS									
04A0 .0511131.	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC	5010 TON	20040	859037	156678	2174340	0	0	797514	3987569
TOTAL	METALS		20,040		156,678		0		797,514	
				859,037		2,174,340		0		3,987,569
04A0 .07	THERMAL & MOISTURE PROTECTION									
04A0 .0711020.	WATER PROOFING MEMBRANE	175000 SF	8750	287350	5425	248546	0	0	135330	676651
TOTAL	THERMAL & MOISTURE PROTECTION		8,750		5,425		0		135,330	
				287,350		248,546		0		676,651
04A0 .15	MECHANICAL									
04A0 .1510052.	DRAINAGE	1 LS	0	0	0	0	222900	0	11145	234045
04A0 .1573251.	FIRE PROTECTION	119440 SF	717	0	0	0	119440	0	5972	125412
TOTAL	MECHANICAL		717		0		342,340		17,117	
				0		0		0		359,457
04A0 .16	ELECTRICAL									
04A0 .1634351.	LIGHTING	119440 SF	1792	0	0	0	179160	0	8958	188118
TOTAL	ELECTRICAL		1,792		0		179,160		8,958	
				0		0		0		188,118
TOTAL	SEGMENT 4		268,641		2,196,344		7,935,353		6,098,667	
				9,959,915		9,039,184		0		35,229,463

WORK BREAKDWN FACIL.STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
252	MINED TUNNEL, 2 TK, LONG'NL SPILING								
252A	MOB/DEMOB	613	21114	21405	0	0	0	13606	56125
252B	DEWATERING	1100	35750	6000	6000	0	0	17300	65050
252C	DRIVE CROWN ADDIT	2850	97295	60506	14900	0	0	55264	227965
252D	SPILE ROOF	2550	90075	29075	69000	0	0	60208	248358
252E	TOP HEADING EXCAVATION	4920	165341	111980	207260	0	0	155066	639647
252F	BENCH EXCAVATION	1855	62376	41740	11300	0	0	36933	152349
252G	LINER & FINISH	9632	391160	36684	197905	92520	0	161064	879333
TOTAL	MINED TUNNEL, 2 TK, LONG'NL SPILING	23,520	863,111	307,390	506,365	92,520	0	499,441	2,268,827
REPORT TOTAL		23,520	863,111	307,390	506,365	92,520	0	499,441	2,268,827

= $22688 /RF

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
252	MINED TUNNEL, 2 TK, LONG'NL SPILING									
252A	MOB/DEMOB									
252A .0296201.	MOBILIZATION/DEMOBILIZATION	1 EA	613	21114	21405	0	0	0	13606	56125
TOTAL	MOB/DEMOB		613	21,114	21,405	0	0	0	13,606	56,125
252B	DEWATERING									
252B .0256100.	DEWATERING FOR LONG. SPILING	100 RF	1100	35750	6000	6000	0	0	17300	65050
TOTAL	DEWATERING		1,100	35,750	6,000	6,000	0	0	17,300	65,050
252C	DRIVE CROWN ADDIT									
252C .0296202.	DRIVE ADDIT	100 RF	2850	97295	60506	14900	0	0	55264	227965
TOTAL	DRIVE CROWN ADDIT		2,850	97,295	60,506	14,900	0	0	55,264	227,965
252D	SPILE ROOF									
252D .0296203.	SPILE ROOF	100 RF	2550	90075	29075	69000	0	0	60208	248358
TOTAL	SPILE ROOF		2,550	90,075	29,075	69,000	0	0	60,208	248,358
252E	TOP HEADING EXCAVATION									
252E .0296204.	TOP HEADING EXCAVATION	100 RF	4920	165341	111980	207260	0	0	155066	639647
TOTAL	TOP HEADING EXCAVATION		4,920	165,341	111,980	207,260	0	0	155,066	639,647
252F	BENCH EXCAVATION									
252F .0296205.	BENCH EXCAVATION	100 RF	1855	62376	41740	11300	0	0	36933	152349
TOTAL	BENCH EXCAVATION		1,855	62,376	41,740	11,300	0	0	36,933	152,349
252G	LINER & FINISH									
252G .0267250.	INSTRUMENTATION	100 RF	0	0	0	0	8000	0	400	8400
252G .0313206.	NEOPRENE WATERSTOPS,DB, 6"	400 LF	36	1614	34	2252	0	0	975	4875
252G .0315801.	FORMS - TUNNEL WALLS & CEILING	12600 SF	3780	161706	5670	12030	0	0	44852	224258
252G .0332302.	REBAR - TUNNEL	230000 LB	2990	122837	6900	64883	0	0	48655	243275
252G .0334302.	CONCRETE - WALKWAY (TUNNEL)	46 CY	92	3360	828	3394	0	0	1896	9478
252G .0340560.	LEAN CONCRETE FILL	79 CY	40	1517	371	3600	0	0	1372	6860

REPORT D1 - ESTIMATE DETAIL BY FACILITY

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
252G .0343183.	CONCRETE - TUNNEL INVERT PUMPED, 3000 PSI	362 CY	489	18301	4572	26708	0	0	12395	61976
252G .0344804.	CONCRETE - TUNNEL ARCH PUMPED, 4000 PSI	920 CY	1610	60254	16864	67878	0	0	36249	181245
252G .0553110.	WALL HANDRAIL GALV.	200 LF	40	1720	240	2841	0	0	1200	6001
252G .0554140.	METAL WALKWAY 2.5' WIDE (SUBWAY)	200 LF	160	6879	960	3099	0	0	2735	13673
252G .0711020.	WATER PROOFING MEMBRANE	7900 SF	395	12972	245	11220	0	0	6109	30546
252G .0955250.	CENTER WALL PARTITION	2800 SF	0	0	0	0	42000	0	2100	44100
252G .1510051.	DRAINAGE FOR MINED TUNNEL	100 RF	0	0	0	0	13000	0	650	13650
252G .1573201.	WET STANDPIPE	200 TF	0	0	0	0	20000	0	1000	21000
252G .1634200.	LIGHTING (SUBWAY)	200 LF	0	0	0	0	9520	0	476	9996
TOTAL	LINER & FINISH		9,632	391,160	36,684	197,905	92,520	0	161,064	879,333
TOTAL	MINED TUNNEL, 2 TK, LONG'NL SPILING		23,520	863,111	307,390	506,365	92,520	0	499,441	2,268,827
REPORT TOTAL			23,520	863,111	307,390	506,365	92,520	0	499,441	2,268,827

REPORT S1 - ESTIMATE SUMMARY BY FACILITY

WORK BREAKDWN FACIL.	STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
30		STATIONS								
301		1A - MISSION BAY STA - 2 TRACK								
301	.00	FACILITY DESCRIPTION ONLY	0	0	0	0	0	0	0	0
301	.02	SITEWORK	0	0	0	0	22400	0	1120	23520
301	.03	CONCRETE	9025	387784	23155	149496	0	0	140109	700544
301	.05	METALS	1021	43896	6126	159089	75000	0	56028	340139
301	.09	FINISHES	1210	0	0	0	172720	0	8636	181356
301	.12	FURNISHINGS	88	0	0	0	72050	0	3603	75653
301	.13	BUILDINGS	0	0	0	0	240000	0	12000	252000
301	.15	MECHANICAL	122	0	0	0	39100	0	1955	41055
301	.16	ELECTRICAL	306	0	0	0	166000	0	8300	174300
	TOTAL	1A - MISSION BAY STA - 2 TRACK	11,772	431,680	29,281	308,585	787,270	0	231,751	1,788,567
302		1B - MISSION BAY STA - 3 TRACK								
302	.00	FACILITY DESCRIPTION ONLY	0	0	0	0	0	0	0	0
302	.02	SITEWORK	139	4942	593	5165	22400	0	3851	36951
302	.03	CONCRETE	5997	259079	18440	125915	0	0	100859	504293
302	.05	METALS	411	17670	2466	62618	75000	0	24439	182193
302	.09	FINISHES	1367	0	0	0	199240	0	9962	209202
302	.12	FURNISHINGS	88	0	0	0	72050	0	3603	75653
302	.13	BUILDINGS	0	0	0	0	240000	0	12000	252000
302	.15	MECHANICAL	139	0	0	0	49820	0	2491	52311
302	.16	ELECTRICAL	347	0	0	0	170080	0	8504	178584
	TOTAL	1B - MISSION BAY STA - 3 TRACK	8,488	281,691	21,499	193,698	828,590	0	165,709	1,491,187

WORK BREAKDWN FACIL.	STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
327		5A - TB TERM SUBWAY STA - HIGHRISE								
327	.00	FACILITY DESCRIPTION ONLY	0	0	0	0	0	0	0	0
327	.02	SITEWORK	127672	3343726	1789981	590600	12587708	0	2741929	21053944
327	.03	CONCRETE	204486	8549501	873215	7398261	0	0	4205245	21026222
327	.05	METALS	31400	1345996	245493	3406900	0	0	1249597	6247986
327	.07	THERMAL & MOISTURE PROTECTION	14555	477986	9024	413439	0	0	225112	1125561
327	.09	FINISHES	0	0	0	0	12000000	0	600000	12600000
327	.13	BUILDINGS	0	0	0	0	9150000	0	457500	9607500
327	.15	MECHANICAL	0	0	0	0	7451000	0	372550	7823550
327	.16	ELECTRICAL	0	0	0	0	1050000	0	52500	1102500
	TOTAL	5A - TB TERM SUBWAY STA - HIGHRISE	378,113		2,917,713		42,238,708		9,904,433	
				13,717,209		11,809,200		0		80,587,263
329		5B - TB TERM SUBWAY STA - TB SHORT								
329	.00	FACILITY DESCRIPTION ONLY	0	0	0	0	0	0	0	0
329	.02	SITEWORK	120612	3298500	1759887	590600	11853650	0	2675097	20177734
329	.03	CONCRETE	196724	8236989	833454	6907570	0	0	3994505	19972518
329	.05	METALS	31400	1345996	245493	3406900	0	0	1249597	6247986
329	.07	THERMAL & MOISTURE PROTECTION	14555	477986	9024	413439	0	0	225112	1125561
329	.09	FINISHES	0	0	0	0	12000000	0	600000	12600000
329	.13	BUILDINGS	0	0	0	0	6850000	0	342500	7192500
329	.15	MECHANICAL	0	0	0	0	7451000	0	372550	7823550
329	.16	ELECTRICAL	0	0	0	0	1050000	0	52500	1102500
	TOTAL	5B - TB TERM SUBWAY STA - TB SHORT	363,291		2,847,858		39,204,650		9,511,861	
				13,359,471		11,318,509		0		76,242,349
330		5D-TB TERM SUBWAY STA, NO HIGH RISE								
330	.00	FACILITY DESCRIPTION ONLY	0	0	0	0	0	0	0	0
330	.02	SITEWORK	120612	3298500	1759887	590600	11853650	0	2675097	20177734
330	.03	CONCRETE	196724	8236989	833454	6907570	0	0	3994505	19972518
330	.05	METALS	31400	1345996	245493	3406900	0	0	1249597	6247986
330	.07	THERMAL & MOISTURE PROTECTION	14555	477986	9024	413439	0	0	225112	1125561
330	.09	FINISHES	0	0	0	0	12000000	0	600000	12600000
330	.13	BUILDINGS	0	0	0	0	9150000	0	457500	9607500
330	.15	MECHANICAL	0	0	0	0	7451000	0	372550	7823550
330	.16	ELECTRICAL	0	0	0	0	1050000	0	52500	1102500
	TOTAL	5D-TB TERM SUBWAY STA, NO HIGH RISE	363,291		2,847,858		41,504,650		9,626,861	
				13,359,471		11,318,509		0		78,657,349

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
301	1A - MISSION BAY STATION									
301 .0000041.	STATION @ TOWNSEND BETWEEN 5TH & 6TH STREETS 2 TRACKS	1 EA	0	0	0	0	0	0	0	0
301 .0214209.	SITE CLEARING	1 LS	0	0	0	0	2000	0	100	2100
301 .0225103.	SUBBASE (AB)	680 CY	0	0	0	0	20400	0	1020	21420
301 .0310100.	FORMS - GENERAL	25930 SF	5445	244081	5212	25039	0	0	68583	342915
301 .0332309.	REBAR - GENERAL	112950 LB	2259	95452	16378	31863	0	0	35923	179616
301 .0344301.	CONCRETE - PLATFORM	935 CY	468	17094	554	68984	0	0	21658	108290
301 .0354201.	CONCRETE - CURB	320 CY	853	31157	1011	23610	0	0	13945	69723
301 .0553115.	GUARD RAIL ON TOP OF OUTSIDE CURB	1700 LF	340	14618	2040	55335	0	0	17998	89991
301 .0554150.	RAILING, ORNAMENTAL ALUMINUM	1362 LF	681	29278	4086	103754	0	0	34280	171398
301 .0554201.	MISC METAL	1 LS	0	0	0	0	75000	0	3750	78750
301 .0931138.	PLATFORM EDGE STRIP	1360 LF	68	0	0	0	20400	0	1020	21420
301 .0931139.	PLATFORM SURFACE FINISH	19040 SF	1142	0	0	0	152320	0	7616	159936
301 .1275011.	OUTSIDE BENCHES	20 EA	40	0	0	0	24000	0	1200	25200
301 .1275012.	INSIDE BENCHES	12 EA	48	0	0	0	42000	0	2100	44100
301 .1275021.	FURNISH AND INSTALL TRASH RECEPTACLES	11 EA	0	0	0	0	6050	0	303	6353
301 .1310005.	PASSENGER WAITING SHELTERS	3000 SF	0	0	0	0	240000	0	12000	252000
301 .1510055.	DRAINAGE PIPE AND CLEANOUTS	1 LS	0	0	0	0	2700	0	135	2835
301 .1510056.	LOCOMOTIVE SPILL CONTAINMENT SYSTEM	4 EA	0	0	0	0	16000	0	800	16800
301 .1573251.	FIRE PROTECTION	20400 SF	122	0	0	0	20400	0	1020	21420
301 .1634101.	STATION LIGHTING	20400 SF	306	0	0	0	30600	0	1530	32130
301 .1634303.	ELECTRICAL SERVICE	1 LS	0	0	0	0	135400	0	6770	142170
TOTAL	1A - MISSION BAY STATION		11,772	431,680	29,281	308,585	787,270	0	231,751	1,788,567
REPORT TOTAL			11,772	431,680	29,281	308,585	787,270	0	231,751	1,788,567

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
302	1B - MISSION BAY STATION									
302 .0000042.	STATION @ TOWNSEND BETWEEN 5TH & 6TH STREETS 3 TRACKS	1 EA	0	0	0	0	0	0	0	0
302 .0214209.	SITE CLEARING	1 LS	0	0	0	0	2000	0	100	2100
302 .0225103.	SUBBASE (AB)	680 CY	0	0	0	0	20400	0	1020	21420
302 .0271128.	FENCE, 8' HIGH, CHAIN LINK W/ BARBED WIRE	680 LF	139	4942	593	5165	0	0	2731	13431
302 .0310100.	FORMS - GENERAL	16400 SF	3444	154383	3296	15837	0	0	43379	216895
302 .0332309.	REBAR - GENERAL	99900 LB	1998	84424	14486	28182	0	0	31773	158865
302 .0344301.	CONCRETE - PLATFORM	1110 CY	555	20272	658	81896	0	0	25707	128533
302 .0554150.	RAILING, ORNAMENTAL ALUMINUM	822 LF	411	17670	2466	62618	0	0	20689	103443
302 .0554201.	MISC METAL	1 LS	0	0	0	0	75000	0	3750	78750
302 .0931138.	PLATFORM EDGE STRIP	2040 LF	102	0	0	0	30600	0	1530	32130
302 .0931139.	PLATFORM SURFACE FINISH	21080 SF	1265	0	0	0	168640	0	8432	177072
302 .1275011.	OUTSIDE BENCHES	20 EA	40	0	0	0	24000	0	1200	25200
302 .1275012.	INSIDE BENCHES	12 EA	48	0	0	0	42000	0	2100	44100
302 .1275021.	FURNISH AND INSTALL TRASH RECEPTACLES	11 EA	0	0	0	0	6050	0	303	6353
302 .1310005.	PASSENGER WAITING SHELTERS	3000 SF	0	0	0	0	240000	0	12000	252000
302 .1510055.	DRAINAGE PIPE AND CLEANOUTS	1 LS	0	0	0	0	2700	0	135	2835
302 .1510056.	LOCOMOTIVE SPILL CONTAINMENT SYSTEM	6 EA	0	0	0	0	24000	0	1200	25200
302 .1573251.	FIRE PROTECTION	23120 SF	139	0	0	0	23120	0	1156	24276
302 .1634101.	STATION LIGHTING	23120 SF	347	0	0	0	34680	0	1734	36414
302 .1634303.	ELECTRICAL SERVICE	1 LS	0	0	0	0	135400	0	6770	142170
TOTAL	1B - MISSION BAY STATION		8,488	281,691	21,499	193,698	828,590	0	165,709	1,491,187
REPORT TOTAL			8,488	281,691	21,499	193,698	828,590	0	165,709	1,491,187

WORK BREAKDWN FACIL.STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
392	PEDESTRIAN SUBWAY TO MARKET STREET								
392 .00	FACILITY DESCRIPTION ONLY	0	0	0	0	0	0	0	0
392 .02	SITEWORK	59092	1324528	460588	653750	5005397	0	1029691	8473954
392 .03	CONCRETE	44333	1883455	193740	1168190	0	0	811348	4056733
392 .05	METALS	9007	302635	55197	766010	485380	0	305230	1914452
392 .09	FINISHES	10922	0	0	0	832621	0	41631	874252
392 .15	MECHANICAL	3483	0	0	0	4582625	0	229132	4811757
392 .16	ELECTRICAL	639	0	0	0	73885	0	3694	77579
TOTAL	PEDESTRIAN SUBWAY TO MARKET STREET	127,476	3,510,618	709,525	2,587,950	10,979,908	0	2,420,726	20,208,727
REPORT TOTAL		127,476	3,510,618	709,525	2,587,950	10,979,908	0	2,420,726	20,208,727

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
327	5A - TB TERM SUBWAY STA - HIGHRISE									
327 .00	FACILITY DESCRIPTION ONLY									
327 .0000002.	SEG 5A - HIGH RISE OPTION 6 TRACK/3 PLATFORMS 1,035' X 175' X 34' DEEP	1 EA	0	0	0	0	0	0	0	0
TOTAL	FACILITY DESCRIPTION ONLY		0		0		0		0	
				0		0		0		0
327 .02	SITEWORK									
327 .0214100.	SAW CUT ROAD PAVEMENT	1900 LF	228	7535	1556	10058	0	0	4642	23791
327 .0214105.	REMOVE ROAD & PARKING PAVEMENT	6000 SY	1200	45868	7764	0	0	0	21453	75085
327 .0214220.	TRAFFIC MAINTENANCE (TYP)	1325 RF	6625	0	0	0	240898	0	12045	252943
327 .0214515.	STREET DECKING W/STEEL GIRDER AND TIMBER	6000 SY	17778	769737	145374	553350	464100	0	444584	2377145
327 .0214632.	REMOVE CONCRETE GUIDE WALLS	5574 LF	0	0	0	0	506732	0	25337	532069
327 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	2475 CY	0	0	0	0	157509	0	7875	165384
327 .0220228.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	209000 SF	27170	0	0	0	4598000	0	229900	4827900
327 .0220229.	Temporary Bulkhead Wall Install and Remove	16000 SF	0	0	0	0	800000	0	40000	840000
327 .0220241.	HAUL TO DUMP - EXCAV MAT'L	246750 CY	24675	913469	1000325	0	734081	0	802222	3450097
327 .0220242.	DUMP FEE	246750 CY	0	0	0	0	2961000	0	148050	3109050
327 .0220332.	COMPACTED FILL	2340 CY	707	25013	3824	27192	0	0	14254	70283
327 .0221109.	DEWATERING	1075 RF	0	0	0	0	390913	0	19546	410459
327 .0221120.	EXCAV MASS-2CY CLAMSHELL	264850 CY	34431	1582104	631138	0	0	0	885297	3098539
327 .0233813.	14" X 14" PRECAST PILE	70750 LF	14858	0	0	0	1648475	0	82424	1730899
327 .0267250.	INSTRUMENTATION	1075 RF	0	0	0	0	86000	0	4300	90300
TOTAL	SITEWORK		127,672		1,789,981		12,587,708		2,741,929	
				3,343,726		590,600		0		21,053,944
327 .03	CONCRETE									
327 .0310100.	FORMS - GENERAL	320000 SF	67200	3012352	64320	309008	0	0	846420	4232100
327 .0313206.	NEOPRENE WATERSTOPS,DB, 6"	2520 LF	227	10176	217	14185	0	0	6145	30723
327 .0332300.	REBAR - GENERAL	9680000 LB	87120	3681183	629200	2730728	0	0	1760278	8801389
327 .0344302.	CONCRETE - SOG & LOW PLATFORM	43000 CY	25800	942388	30573	3172540	0	0	1036375	5181876
327 .0344830.	CONCRETE - SUPPORTED SLAB AND BEAMS	8400 CY	8400	314370	51820	583296	0	0	237372	1186858
327 .0354400.	CONCRETE - EXTERIOR WALLS	6365 CY	11139	416877	68710	441986	0	0	231893	1159466
327 .0364103.	CONCRETE (4000 PSI) - COLUMNS	2110 CY	4600	172155	28375	146518	0	0	86762	433810

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG		DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
	TOTAL	CONCRETE		204,486		873,215		0		4,205,245	
					8,549,501		7,398,261		0		21,026,222
327 .05		METALS									
327 .0511131.		STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC	7850 TON	31400	1345996	245493	3406900	0	0	1249597	6247986
	TOTAL	METALS		31,400		245,493		0		1,249,597	
					1,345,996		3,406,900		0		6,247,986
327 .07		THERMAL & MOISTURE PROTECTION									
327 .0711020.		WATER PROOFING MEMBRANE	291100 SF	14555	477986	9024	413439	0	0	225112	1125561
	TOTAL	THERMAL & MOISTURE PROTECTION		14,555		9,024		0		225,112	
					477,986		413,439		0		1,125,561
327 .09		FINISHES									
327 .0901005.		ARCHITECTURAL FINISHES, ESCALATORS, ELEVATORS, STAIRS (FINGER & MOY)	1 LS	0	0	0	0	12000000	0	600000	12600000
	TOTAL	FINISHES		0		0		12,000,000		600,000	
					0		0		0		12,600,000
327 .13		BUILDINGS									
327 .1310011.		WEST ENTRY ENCLOSURE - WEST OF FIRST STREET 100' X 150'	1 LS	0	0	0	0	1800000	0	90000	1890000
327 .1310012.		MAIN HEADHOUSE - 275' X 150'	1 LS	0	0	0	0	7350000	0	367500	7717500
	TOTAL	BUILDINGS		0		0		9,150,000		457,500	
					0		0		0		9,607,500
327 .15		MECHANICAL									
327 .1510050.		DRAINAGE	1 LS	0	0	0	0	233000	0	11650	244650
327 .1571103.		VENTILATION SHAFT & EQUIP	2 EA	0	0	0	0	3600000	0	180000	3780000
327 .1571112.		STATION HVAC	1 LS	0	0	0	0	1000000	0	50000	1050000
327 .1573200.		FIREPROTECTION	1 LS	0	0	0	0	750000	0	37500	787500
327 .1573201.		WET STANDPIPE	5340 TF	0	0	0	0	534000	0	26700	560700
327 .1573202.		WET STANDPIPE DELUGE SYSTEM ADJACENT TO TRACKWAY	5340 TF	0	0	0	0	534000	0	26700	560700
327 .1574101.		STATION PLUMBING	1 LS	0	0	0	0	800000	0	40000	840000

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY		MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
		TOTAL	MECHANICAL			0		0		7,451,000		372,550	
							0		0		0		7,823,550
327	.16		ELECTRICAL										
327	.1634301.		STATION POWER INCLUDING EMERGENCY GENERATOR	1	LS	0	0	0	0	950000	0	47500	997500
327	.1668001.		UPS - SYSTEM (UNINTERRUPTED POWER SYSTEM)	1	LS	0	0	0	0	100000	0	5000	105000
		TOTAL	ELECTRICAL			0		0		1,050,000		52,500	
							0		0		0		1,102,500
		TOTAL	5A - TB TERM SUBWAY STA - HIGHRISE			378,113		2,917,713		42,238,708		9,904,433	
							13,717,209		11,809,200		0		80,587,263
329			5B - TB TERM SUBWAY STA - TB SHORT										
329	.00		FACILITY DESCRIPTION ONLY										
329	.0000006.		SEG 5B - BUS TERMINAL OPTION 6 TRACK/3 PLATFORMS 1,035' X 175' X 34' DEEP	1	EA	0	0	0	0	0	0	0	0
		TOTAL	FACILITY DESCRIPTION ONLY			0		0		0		0	
							0		0		0		0
329	.02		SITEWORK										
329	.0214100.		SAW CUT ROAD PAVEMENT	1900	LF	228	7535	1556	10058	0	0	4642	23791
329	.0214105.		REMOVE ROAD & PARKING PAVEMENT	6000	SY	1200	45868	7764	0	0	0	21453	75085
329	.0214220.		TRAFFIC MAINTENANCE (TYP)	1325	RF	6625	0	0	0	240898	0	12045	252943
329	.0214515.		STREET DECKING W/STEEL GIRDER AND TIMBER	6000	SY	17778	769737	145374	553350	464100	0	444584	2377145
329	.0214632.		REMOVE CONCRETE GUIDE WALLS	5574	LF	0	0	0	0	506732	0	25337	532069
329	.0214634.		REMOVE TOP OF SOIL CEMENT WALL	2475	CY	0	0	0	0	157509	0	7875	165384
329	.0220228.		3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	209000	SF	27170	0	0	0	4598000	0	229900	4827900
329	.0220229.		Temporary Bulkhead Wall Install and Remove	16000	SF	0	0	0	0	800000	0	40000	840000
329	.0220241.		HAUL TO DUMP - EXCAV MAT'L	242075	CY	24208	896180	981372	0	720173	0	787029	3384754
329	.0220242.		DUMP FEE	242075	CY	0	0	0	0	2904900	0	145245	3050145
329	.0220332.		COMPACTED FILL	2340	CY	707	25013	3824	27192	0	0	14254	70283
329	.0221109.		DEWATERING	1075	RF	0	0	0	0	390913	0	19546	410459
329	.0221120.		EXCAV MASS-2CY CLAMSHELL	260175	CY	33823	1554167	619997	0	0	0	869666	3043830
329	.0233813.		14" X 14" PRECAST PILE	42250	LF	8873	0	0	0	984425	0	49221	1033646

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
329	.0267250.		INSTRUMENTATION	1075 RF	0	0	0	0	86000	0	4300	90300
	TOTAL		SITEWORK		120,612		1,759,887		11,853,650		2,675,097	
						3,298,500		590,600		0		20,177,734
329	.03		CONCRETE									
329	.0310100.		FORMS - GENERAL	320000 SF	67200	3012352	64320	309008	0	0	846420	4232100
329	.0313206.		NEOPRENE WATERSTOPS,DB, 6"	2520 LF	227	10176	217	14185	0	0	6145	30723
329	.0332300.		REBAR - GENERAL	9117500 LB	82058	3467293	592638	2572047	0	0	1657995	8289973
329	.0344302.		CONCRETE - SOG & LOW PLATFORM	38500 CY	23100	843766	27374	2840530	0	0	927918	4639588
329	.0344830.		CONCRETE - SUPPORTED SLAB AND BEAMS	8400 CY	8400	314370	51820	583296	0	0	237372	1186858
329	.0354400.		CONCRETE - EXTERIOR WALLS	6365 CY	11139	416877	68710	441986	0	0	231893	1159466
329	.0364103.		CONCRETE (4000 PSI) - COLUMNS	2110 CY	4600	172155	28375	146518	0	0	86762	433810
	TOTAL		CONCRETE		196,724		833,454		0		3,994,505	
						8,236,989		6,907,570		0		19,972,518
329	.05		METALS									
329	.0511131.		STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC	7850 TON	31400	1345996	245493	3406900	0	0	1249597	6247986
	TOTAL		METALS		31,400		245,493		0		1,249,597	
						1,345,996		3,406,900		0		6,247,986
329	.07		THERMAL & MOISTURE PROTECTION									
329	.0711020.		WATER PROOFING MEMBRANE	291100 SF	14555	477986	9024	413439	0	0	225112	1125561
	TOTAL		THERMAL & MOISTURE PROTECTION		14,555		9,024		0		225,112	
						477,986		413,439		0		1,125,561
329	.09		FINISHES									
329	.0901005.		ARCHITECTURAL FINISHES, ESCALATORS, ELEVATORS, STAIRS (FINGER & MOY)	1 LS	0	0	0	0	12000000	0	600000	12600000
	TOTAL		FINISHES		0		0		12,000,000		600,000	
						0		0		0		12,600,000
329	.13		BUILDINGS									
329	.1310011.		WEST ENTRY ENCLOSURE - WEST OF FIRST STREET 100' X 150', 3/4 OF HIRISE	1 LS	0	0	0	0	1350000	0	67500	1417500
329	.1310012.		MAIN HEADHOUSE - 275' X 150' 3/4 COST OF HIGH RISE	1 LS	0	0	0	0	5500000	0	275000	5775000

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG		DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
	TOTAL	BUILDINGS		0		0		6,850,000		342,500	
					0		0		0		7,192,500
329	.15	MECHANICAL									
329	.1510050.	DRAINAGE	1 LS	0	0	0	0	233000	0	11650	244650
329	.1571103.	VENTILATION SHAFT & EQUIP	2 EA	0	0	0	0	3600000	0	180000	3780000
329	.1571112.	STATION HVAC	1 LS	0	0	0	0	1000000	0	50000	1050000
329	.1573200.	FIREPROTECTION	1 LS	0	0	0	0	750000	0	37500	787500
329	.1573201.	WET STANDPIPE	5340 TF	0	0	0	0	534000	0	26700	560700
329	.1573202.	WET STANDPIPE DELUGE SYSTEM ADJACENT TO TRACKWAY	5340 TF	0	0	0	0	534000	0	26700	560700
329	.1574101.	STATION PLUMBING	1 LS	0	0	0	0	800000	0	40000	840000
	TOTAL	MECHANICAL		0		0		7,451,000		372,550	
					0		0		0		7,823,550
329	.16	ELECTRICAL									
329	.1634301.	STATION POWER INCLUDING EMERGENCY GENERATOR	1 LS	0	0	0	0	950000	0	47500	997500
329	.1668001.	UPS - SYSTEM (UNINTERRUPTED POWER SYSTEM)	1 LS	0	0	0	0	100000	0	5000	105000
	TOTAL	ELECTRICAL		0		0		1,050,000		52,500	
					0		0		0		1,102,500
	TOTAL	5B - TB TERM SUBWAY STA - TB SHORT		363,291		2,847,858		39,204,650		9,511,861	
					13,359,471		11,318,509		0		76,242,349
330		5D-TB TERM SUBWAY STA, NO HIGH RISE									
330	.00	FACILITY DESCRIPTION ONLY									
330	.0000007.	SEG 5D- TB TERMINAL STATION 6 TRK/3 PLTF, NO HI-RISE, NO BUS TERM 1,035'x175'x34'D	1 EA	0	0	0	0	0	0	0	0
	TOTAL	FACILITY DESCRIPTION ONLY		0		0		0		0	
					0		0		0		0
330	.02	SITEWORK									
330	.0214100.	SAW CUT ROAD PAVEMENT	1900 LF	228	7535	1556	10058	0	0	4642	23791
330	.0214105.	REMOVE ROAD & PARKING PAVEMENT	6000 SY	1200	45868	7764	0	0	0	21453	75085
330	.0214220.	TRAFFIC MAINTENANCE (TYP)	1325 RF	6625	0	0	0	240898	0	12045	252943
330	.0214515.	STREET DECKING W/STEEL GIRDER AND TIMBER	6000 SY	17778	769737	145374	553350	464100	0	444584	2377145
330	.0214632.	REMOVE CONCRETE GUIDE WALLS	5574 LF	0	0	0	0	506732	0	25337	532069

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
330 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	2475 CY	0	0	0	0	157509	0	7875	165384
330 .0220228.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	209000 SF	27170	0	0	0	4598000	0	229900	4827900
330 .0220229.	Temporary Bulkhead Wall Install and Remove	16000 SF	0	0	0	0	800000	0	40000	840000
330 .0220241.	HAUL TO DUMP - EXCAV MAT'L	242075 CY	24208	896180	981372	0	720173	0	787029	3384754
330 .0220242.	DUMP FEE	242075 CY	0	0	0	0	2904900	0	145245	3050145
330 .0220332.	COMPACTED FILL	2340 CY	707	25013	3824	27192	0	0	14254	70283
330 .0221109.	DEWATERING	1075 RF	0	0	0	0	390913	0	19546	410459
330 .0221120.	EXCAV MASS-2CY CLAMSHELL	260175 CY	33823	1554167	619997	0	0	0	869666	3043830
330 .0233813.	14" X 14" PRECAST PILE	42250 LF	8873	0	0	0	984425	0	49221	1033646
330 .0267250.	INSTRUMENTATION	1075 RF	0	0	0	0	86000	0	4300	90300
TOTAL	SITEWORK		120,612	1,759,887		11,853,650		2,675,097		
				3,298,500		590,600		0		20,177,734
330 .03	CONCRETE									
330 .0310100.	FORMS - GENERAL	320000 SF	67200	3012352	64320	309008	0	0	846420	4232100
330 .0313206.	NEOPRENE WATERSTOPS,DB, 6"	2520 LF	227	10176	217	14185	0	0	6145	30723
330 .0332300.	REBAR - GENERAL	9117500 LB	82058	3467293	592638	2572047	0	0	1657995	8289973
330 .0344302.	CONCRETE - SOG & LOW PLATFORM	38500 CY	23100	843766	27374	2840530	0	0	927918	4639588
330 .0344830.	CONCRETE - SUPPORTED SLAB AND BEAMS	8400 CY	8400	314370	51820	583296	0	0	237372	1186858
330 .0354400.	CONCRETE - EXTERIOR WALLS	6365 CY	11139	416877	68710	441986	0	0	231893	1159466
330 .0364103.	CONCRETE (4000 PSI) - COLUMNS	2110 CY	4600	172155	28375	146518	0	0	86762	433810
TOTAL	CONCRETE		196,724		833,454		0	3,994,505		
				8,236,989		6,907,570		0		19,972,518
330 .05	METALS									
330 .0511131.	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC	7850 TON	31400	1345996	245493	3406900	0	0	1249597	6247986
TOTAL	METALS		31,400		245,493		0	1,249,597		
				1,345,996		3,406,900		0		6,247,986
330 .07	THERMAL & MOISTURE PROTECTION									
330 .0711020.	WATER PROOFING MEMBRANE	291100 SF	14555	477986	9024	413439	0	0	225112	1125561
TOTAL	THERMAL & MOISTURE PROTECTION		14,555		9,024		0	225,112		
				477,986		413,439		0		1,125,561
330 .09	FINISHES									

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
330 .0901005.	ARCHITECTURAL FINISHES, ESCALATORS, ELEVATORS, STAIRS (FINGER & MOY)	1 LS	0	0	0	0	12000000	0	600000	12600000
TOTAL	FINISHES		0		0		12,000,000		600,000	
				0		0		0		12,600,000
330 .13	BUILDINGS									
330 .1310011.	WEST ENTRY ENCLOSURE - WEST OF FIRST STREET 100' X 150'	1 LS	0	0	0	0	1800000	0	90000	1890000
330 .1310012.	MAIN HEADHOUSE - 275' X 150'	1 LS	0	0	0	0	7350000	0	367500	7717500
TOTAL	BUILDINGS		0		0		9,150,000		457,500	
				0		0		0		9,607,500
330 .15	MECHANICAL									
330 .1510050.	DRAINAGE	1 LS	0	0	0	0	233000	0	11650	244650
330 .1571103.	VENTILATION SHAFT & EQUIP	2 EA	0	0	0	0	3600000	0	180000	3780000
330 .1571112.	STATION HVAC	1 LS	0	0	0	0	1000000	0	50000	1050000
330 .1573200.	FIREPROTECTION	1 LS	0	0	0	0	750000	0	37500	787500
330 .1573201.	WET STANDPIPE	5340 TF	0	0	0	0	534000	0	26700	560700
330 .1573202.	WET STANDPIPE DELUGE SYSTEM ADJACENT TO TRACKWAY	5340 TF	0	0	0	0	534000	0	26700	560700
330 .1574101.	STATION PLUMBING	1 LS	0	0	0	0	800000	0	40000	840000
TOTAL	MECHANICAL		0		0		7,451,000		372,550	
				0		0		0		7,823,550
330 .16	ELECTRICAL									
330 .1634301.	STATION POWER INCLUDING EMERGENCY GENERATOR	1 LS	0	0	0	0	950000	0	47500	997500
330 .1668001.	UPS - SYSTEM (UNINTERRUPTED POWER SYSTEM)	1 LS	0	0	0	0	100000	0	5000	105000
TOTAL	ELECTRICAL		0		0		1,050,000		52,500	
				0		0		0		1,102,500
TOTAL	5D-TB TERM SUBWAY STA, NO HIGH RISE		363,291		2,847,858		41,504,650		9,626,861	
				13,359,471		11,318,509		0		78,657,349

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
392	PEDESTRIAN SUBWAY TO MARKET STREET									
392 .00	FACILITY DESCRIPTION ONLY									
392 .0000008.	TO EMBARCADERO BART STATION 830' X 33' X 14' HIGH	1 EA	0	0	0	0	0	0	0	0
TOTAL	FACILITY DESCRIPTION ONLY		0		0		0		0	
				0		0		0		0
392 .02	SITEWORK									
392 .0214100.	SAW CUT ROAD PAVEMENT	1660 LF	199	6577	1360	8788	0	0	4054	20779
392 .0214101.	REMOVE ROAD PAVEMENT- 16"THK.	5075 SY	1269	48505	8206	0	0	0	22684	79395
392 .0214220.	TRAFFIC MAINTENANCE (TYP)	830 RF	4150	0	0	0	150902	0	7545	158447
392 .0214515.	STREET DECKING W/STEEL GIRDER AND TIMBER	5075 SY	15037	651059	122962	468042	392551	0	376040	2010654
392 .0214632.	REMOVE CONCRETE GUIDE WALLS	3480 LF	0	0	0	0	316367	0	15818	332185
392 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	1550 CY	0	0	0	0	98642	0	4932	103574
392 .0214703.	CUT OPENING TO BART, FRAME & FINISH	1 LS	1600	0	0	0	85000	0	4250	89250
392 .0220228.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	121800 SF	15834	0	0	0	2679600	0	133980	2813580
392 .0220241.	HAUL TO DUMP - EXCAV MAT'L	47100 CY	4710	174364	190943	0	140123	0	153129	658559
392 .0220242.	DUMP FEE	47100 CY	0	0	0	0	565200	0	28260	593460
392 .0220332.	COMPACTED FILL	15225 CY	4598	162671	24878	176920	0	0	92712	457181
392 .0221111.	DEWATERING	830 RF	1868	0	0	0	166000	0	8300	174300
392 .0221120.	EXCAV MASS-2CY CLAMSHELL	47100 CY	6123	281352	112239	0	0	0	157436	551027
392 .0233813.	14" X 14" PRECAST PILE	17640 LF	3704	0	0	0	411012	0	20551	431563
TOTAL	SITEWORK		59,092		460,588		5,005,397		1,029,691	
				1,324,528		653,750		0		8,473,954
392 .03	CONCRETE									
392 .0310100.	FORMS - GENERAL	89750 SF	18848	844893	18040	86667	0	0	237400	1187000
392 .0332300.	REBAR - GENERAL	1950750 LB	17557	741856	126799	550307	0	0	354741	1773703
392 .0334300.	CONCRETE - SLAB ON GRADE	2925 CY	1463	54753	9021	203112	0	0	66722	333608
392 .0344820.	CONCRETE - UPPER SLAB	2405 CY	2405	90007	14836	167003	0	0	67962	339808
392 .0354400.	CONCRETE - EXTERIOR WALLS	2320 CY	4060	151946	25044	161101	0	0	84523	422614
TOTAL	CONCRETE		44,333		193,740		0		811,348	
				1,883,455		1,168,190		0		4,056,733
392 .05	METALS									

--WORK BREAKDOWN--- FACIL.	STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
392	.0511131.	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC	1765 TON	7060	302635	55197	766010	0	0	280961	1404803
392	.0515020.	STAIR ENCLOSURE W/GALV.METAL FRAME AND PLEXIGLASS ROOF	5200 SF	1820	0	0	0	464100	0	23205	487305
392	.0554152.	DOORS W/ELECTROMAG HOLDERS	4 EA	16	0	0	0	2800	0	140	2940
392	.0554153.	EMERG SECURITY ROLL-DOWN GATE W/MAN DOOR	462 SF	111	0	0	0	18480	0	924	19404
	TOTAL	METALS		9,007		55,197		485,380		305,230	
					302,635		766,010		0		1,914,452
392	.09	FINISHES									
392	.0931113.	12" X 12" VIT. PORCELAIN PAVERS	20950 SF	3562	0	0	0	192740	0	9637	202377
392	.0931137.	TUNNEL FACING (STEEL STUDS UNDER ARCH PANEL CLADDING)	24360 SF	3654	0	0	0	292320	0	14616	306936
392	.0941401.	SUSP'D. ACOUSTIC MET. PANELS W/BATTS	27390 SF	3013	0	0	0	271161	0	13558	284719
392	.0955301.	CMU WALL 8" X 8" GLAZED VIT PORCELAIN	3360 SF	437	0	0	0	42000	0	2100	44100
392	.0955355.	PRECAST CONC STAIRS	200 TR	256	0	0	0	34400	0	1720	36120
	TOTAL	FINISHES		10,922		0		832,621		41,631	
					0		0		0		874,252
392	.15	MECHANICAL									
392	.1571111.	HVAC	27390 SF	3287	0	0	0	178035	0	8902	186937
392	.1573251.	FIRE PROTECTION	32590 SF	196	0	0	0	32590	0	1630	34220
392	.1575103.	ELEVATOR	4 EA	0	0	0	0	700000	0	35000	735000
392	.1575200.	ESCALATORS	4 EA	0	0	0	0	952000	0	47600	999600
392	.1575252.	MOVING WALK 48" X 170'	8 EA	0	0	0	0	2720000	0	136000	2856000
	TOTAL	MECHANICAL		3,483		0		4,582,625		229,132	
					0		0		0		4,811,757
392	.16	ELECTRICAL									
392	.1634351.	LIGHTING	32590 SF	489	0	0	0	48885	0	2444	51329
392	.1668011.	INSTRUMENTATION	1 LS	150	0	0	0	25000	0	1250	26250
	TOTAL	ELECTRICAL		639		0		73,885		3,694	
					0		0		0		77,579
	TOTAL	PEDESTRIAN SUBWAY TO MARKET STREET		127,476		709,525		10,979,908		2,420,726	
					3,510,618		2,587,950		0		20,208,727

Memorandum

To: David Minister, ICF KE

From: J.F. Finn, Gensler

Date: 5.21.96

RECEIVED
MAY 2 1 1996
ESTIMATING SERVICES

Subject: Cost Estimates

SEGMENT

Dave per our conversation, following is a set of rough cost estimates, by cost per square foot. Square footage is rough estimate for enclosure. Break down is for each element or enclosure, not including vertical circulation elements or the SamTrans / Muni bus layover and loading paving. Please note these are for architectural components only. Also, these spaces represent purely public spaces. Overall costs in similar facilities normally get reduced by low level ('C' or less) of finishes in ancillary areas.

SA **West Entry Enclosure** (west of First Street)
15,000 SF (100' x 150'); storefront, entry doors, 'B' level of finishes and minimal interior furniture.
@ $120 / SF = $1.8 million

SA **Main Headhouse**
42,000 SF (275' x 150', plus entry element); storefront, entry doors, 'A' level of finishes, more elaborate roof structure and minimal interior furniture.
@ $175 / SF = $7.35 million

SA **Main Public Plaza**
MITI 53,000 SF (275' x 200', minus entry element and dropoff); landscaping, hardscaping, taxi / bus dropoff, minimal street furniture and amenities.
@ $6.5 / SF = $350,000

BUS **Samtrans / Muni Canopy**
30,000 SF (200' x 150'); Simple canopy, open all sides for weather protection and connection for bridge to Main / Beale bus terminal.
@ $45 / SF = $1.35 million

BUS **Bridge Structure**
3,000 SF (20' x 150'); simple covered steel bridge strucutre, open all sides to connect to bus terminal.
$2.5 million (this number is based on a couple of similar bridges we have built recently for airport projects. The cost for these bridges can vary dramatically, but when crossing public streets, costs seem to escalate)

Total Cost = $13.35 million

ICF KAISER

CALTRAIN DOWNTOWN EXTENSION PROJECT
SAN FRANCISCO, CALIFORNIA

SPECIAL TRACKWORK BY SEGMENT

SEGMENT NUMBER	TURNOUTS, DIRECT FIX		TURNOUTS, BALLASTED		CROSSINGS, DIRECT FIX		BUMPERS		PRECAST ROAD CROSSINGS		TIMBER ROAD CROSSINGS		TOTAL COST $
	#	AMOUNT $65,000 EA	#	AMOUNT $50,000 EA	#	AMOUNT $90,000 EA	#	AMOUNT $5,000 EA	#	AMOUNT $25,000/TK	#	AMOUNT $6,000 EA	
1A	0	0	6	300,000	1	90,000	0	0	14	350,000	0	0	740,000
1B	0	0	6	300,000	1	90,000	0	0	11	275,000	0	0	665,000
1C	0	0	6	300,000	1	90,000	0	0	0	0	0	0	390,000
2A	0	0	0	0	0	0	0	0	0	0	0	0	0
2B	0	0	0	0	0	0	0	0	0	0	0	0	0
2C	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	8	520,000	0	0	1	90,000	0	0	0	0	0	0	610,000
5A	0	0	0	0	0	0	6	30,000	0	0	0	0	30,000
5B	0	0	0	0	0	0	6	30,000	0	0	0	0	30,000
5C	0	0	0	0	0	0	6	30,000	0	0	0	0	30,000
SW3A	0	0	16	800,000	1	90,000	6	30,000	0	0	9	54,000	974,000
SW3B	0	0	19	950,000	1	90,000	6	30,000	0	0	9	54,000	1,124,000

ICF KAISER

CALTRAIN DOWNTOWN EXTENSION PROJECT
SAN FRANCISCO, CALIFORNIA

SPECIAL TRACKWORK BY SEGMENT

SEGMENT NUMBER	TURNOUTS, DIRECT FIX		TURNOUTS, BALLASTED		CROSSINGS, DIRECT FIX		BUMPERS		PRECAST ROAD CROSSINGS		TIMBER ROAD CROSSINGS		TOTAL COST $
	#	AMOUNT $65,000 EA	#	AMOUNT $50,000 EA	#	AMOUNT $90,000 EA	#	AMOUNT $5,000 EA	#	AMOUNT $25,000/TK	#	AMOUNT $6,000 EA	
SW3C	0	0	11	550,000	0	0	5	25,000	0	0	13	78,000	653,000
SW4	0	0	17	850,000	0	0	1	5,000	0	0	20	120,000	975,000

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QUANTITY SHEET

REF. NO. 1A → 2C

JOB NO. 65928-005-06
TITLE Cal Train Final
DRG. All Plan & Prof. + TC Dwgs. -R

SUBJECT Trackwork

SHEET 1 OF 3
DATE 5/10/96
BY H. W. H.
CHECKED BY

	DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT/ WEIGHT	QUANTITY			TOTAL QUANTITY		
	1A										
	Track-	2	3,975			7	950	TF			
		3	260				780				
									8	730	TF
	TC's									6	EA
	1B										
	Track-	2	3,935			7	870	TF			
		3	260				780				
									8	650	TF
	TC's									6	EA
	1C										
	Track-	2	4,800			9	600	TF			
		3	260				780				
									10	350	TF
	TC's									6	EA
	2A										
	Track	2	2,215						4	430	TF
	2B										
	Track	2	2,400						4	500	TF
	2C										
	Track	2	2,575						5	150	TF

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QUANTITY SHEET

REF. NO. 3 → SW3A

JOB NO. 65928-005-06
TITLE CalTrain Final
DRG. All Plan & Prof. + Yd. Dwgs. -R

SUBJECT Trackwork

SHEET 2 OF 3
DATE 5/10/96
BY H. W. H.
CHECKED BY

	DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT/ WEIGHT	QUANTITY			TOTAL QUANTITY		
	3										
	Track	2	1,325						2	650	TF
	4										
	Track -	2	260				520	TF			
						1	105				
							790				
							650				
							730				
							570				
							895				
									5	260	TF
	TO's									8	Ea
	5A/B/C										
		6	855						5	130	TF
	16th St. Yard - SW3A										
	Track - Inside					11	610	TF			
	Outside					3	165				
									14	775	TF
	TO's - Outside						7	Ea			
	Inside						9				
										16	Ea

ICF KAISER

QUANTITY SHEET

REF. NO. SW3B → SW4

JOB NO. 65926-005-06 | SUBJECT Trackwork | SHEET 3 OF 3

TITLE Cal Train Final | DATE 5/10/96

DRG. All Plan & Prof. + Yd. Plans -R | BY H. W. H.

CHECKED BY

DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT/ WEIGHT	QUANTITY			TOTAL QUANTITY		
16th St. Yard - SW3B										
Track - Inside					11	510	TF			
Outside					4	600				
								16	210	TF
TO's - Inside						9	Ea			
Outside						10				
									19	Ea
All Yard SW4										
Track - Inside					16	700	TF			
Outside					2	310				
								19	010	TF
TO's									17	Ea

ICF KAISER

QUANTITY SHEET

REF. NO. SW3A-B-C

JOB NO. 65928-005-06
TITLE CalTrain Final
DRG. SK-21 -R

SUBJECT 16th St. Yard
Inside Trackwork Only

SHEET 1 OF 1
DATE 3/28/95 Rev. 4/15/95
BY H.W.H.
CHECKED BY

	DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT/ WEIGHT	QUANTITY			TOTAL QUANTITY		
	Track										
						1	900	TF			
						1	720				
						1	700				
							70				
						1	400				
						1	420				
						1	270				
						1	260				
							870				
									11	610	TF
	#10 Turnouts									9	Ea
	Bumping Posts									5	Ea
	Road Crossings									13	Ea

ICF KAISER

QUANTITY SHEET

REF. NO. SW3A

JOB NO. 65928-005-06
TITLE CalTrain Final
DRG. SK-21 -R
101 & 102

SUBJECT Seg. 1 - Opt. A
16th St. Yard
Outside Trackwork

SHEET 1 OF 1
DATE 4/15/96
BY H.W.H.
CHECKED BY

	DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT/ WEIGHT	QUANTITY	TOTAL QUANTITY
	Track						
	129+25 → 142+50					1 325 TF	
	Down Sta. From 129+25					360	
	Crossover					260	
	"					260	
	So. End of Yard					700	
							2 905 TF
	#10 Turnouts				@ 50.		260 / 3 165 TF
							7 Ea
	Bumping Posts						1 Ea

ICF KAISER

QUANTITY SHEET

REF. NO. SW3B

JOB NO. 65928-005-06
TITLE CalTrain Final
DRG. SK-21 -R
103 & 104

SUBJECT Seq. 1 - Opt. B
16th St. Yard
Outside Trackwork

SHEET 1 OF 1
DATE 4/15/96
BY H. W. H.
CHECKED BY

	DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT/ WEIGHT	QUANTITY			TOTAL QUANTITY		
	Track										
	129+65 → 151+65					2	200	TF			
	Downsta. From 129+65						400				
	#10 Crossover	5	260			1	300				
	~~#~~						-				
	~~#7 Crossover~~						-				
	So. End of Yard						700				
									4	600	TF
	#7 Turnouts										
										~~2~~	Ea
	#10 Turnouts										
										10	Ea
	Bumping Posts										
										1	Ea

ICF KAISER

QUANTITY SHEET

REF. NO. SW3C

JOB NO. 65928-005-06
TITLE CalTrain Final
DRG. 105 SK-21 -R

SUBJECT 16th St. Yard
Outside Trackwork

SHEET 1 OF 1
DATE 5/16/96
BY H. W. H.
CHECKED BY

	DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT/ WEIGHT	QUANTITY			TOTAL QUANTITY		
	Track										
	SK-21 ; Edge of Berry To Yard T.O. - 430'										
	105 ; " " " " " End of Track - 170'										
				430 -	170 =		260	TF			
		1	260				260				
										520	TF
	TO's									2	Ea

ICF KAISER

QUANTITY SHEET

REF. NO. SW4

JOB NO. 65928-005-06
TITLE CalTrain Final
DRG. M. Jones -R
Partially complete Dwg. - Rev. 5/13/96

SUBJECT Alternate Yard Trackwork

SHEET 1 OF 1
DATE 5/3/96
BY H. W. H.
CHECKED BY

	DESCRIPTION	NO. PCS.	LENGTH	WIDTH	HEIGHT/ WEIGHT	QUANTITY			TOTAL QUANTITY		
	Track										
							540	TF			
							390				
						1	700				
						1	730				
						1	790				
						1	910				
						1	730				
						2	250				
							310				
						1	780				
						2	150				
							420				
									16	700	TF
	#10 Turnouts										
										17	Ea

WORK BREAKDWN FACIL.STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
B	BASE CASE: 1500V DC Seg 1 & 2 Only								
B1	SEG 1: SF TERMINAL ST TO 16TH ST								
B11	INCOMING POWER	181	9149	930	9530	0	0	4902	24511
B12	TRACTION POWER SUBSTATION	2409	119784	10500	86007	500600	1111909	332052	2160852
B14	OVERHEAD CONTACT SYSTEM (OCS)	10421	544291	37317	741099	1950	30380	338274	1693311
TOTAL	SEG 1: SF TERMINAL ST TO 16TH ST	13,011	673,224	48,747	836,636	502,550	1,142,289	675,228	3,878,674
B2	SEG 2: 16TH ST YARD								
B21	INCOMING POWER	181	9149	930	9530	0	0	4902	24511
B22	TRACTION POWER SUBSTATION	2409	119784	10500	86007	500600	1111909	332052	2160852
B24	OVERHEAD CONTACT SYSTEM (OCS)	27042	1624278	80612	1149600	150500	37975	723119	3766084
TOTAL	SEG 2: 16TH ST YARD	29,632	1,753,211	92,042	1,245,137	651,100	1,149,884	1,060,073	5,951,447
TOTAL	BASE CASE: 1500V DC Seg 1 & 2 Only	42,643	2,426,435	140,789	2,081,773	1,153,650	2,292,173	1,735,301	9,830,121
REPORT TOTAL		42,643	2,426,435	140,789	2,081,773	1,153,650	2,292,173	1,735,301	9,830,121

WORK BREAKDWN FACIL.STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
C	OPTION 1 : 25KV AC Segs 1 & Seg 2								
C1	SEG 1: SF TERMINAL ST TO 16TH ST								
C13	TIE- BREAKER SUBSTATION	496	23838	2266	10095	400	189875	56519	282993
C14	OVERHEAD CONTACT SYSTEM (OCS)	4363	227879	15648	392094	28950	2713	159586	826870
TOTAL	SEG 1: SF TERMINAL ST TO 16TH ST	4,859	251,717	17,914	402,189	29,350	192,588	216,105	1,109,863
C2	SEG 2: 16TH ST YARD								
C21	INCOMING POWER	251	13109	898	15000	0	0	7252	36259
C22	TRACTION POWER SUBSTATION	2022	100715	8478	39275	900600	1127858	319085	2496011
C23	TIE- BREAKER SUBSTATION	496	23838	2266	10095	400	189875	56519	282993
C24	OVERHEAD CONTACT SYSTEM (OCS)	20634	1239383	61513	888930	6500	43400	558309	2798035
TOTAL	SEG 2: 16TH ST YARD	23,403	1,377,045	73,155	953,300	907,500	1,361,133	941,165	5,613,298
TOTAL	OPTION 1 : 25KV AC Segs 1 & Seg 2	28,262	1,628,762	91,069	1,355,489	936,850	1,553,721	1,157,270	6,723,161
REPORT TOTAL		28,262	1,628,762	91,069	1,355,489	936,850	1,553,721	1,157,270	6,723,161

ICF KAISER ENGINEERS INTERACTIVE ESTIMATING
ELECTRIFYING CALTRAIN/PCS RAILROAD DOKWNTOWN EXT
MAY 1996 - PRELIMINARY ESTIMATE
REPORT S1 - ESTIMATE SUMMARY BY FACILITY

WORK BREAKDWN FACIL.STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D	OPTION 2 : 25KV AC Segs 1 to Seg 5								
D1	SEG 1: SF TERMINAL ST TO 16TH ST								
D13	TIE- BREAKER SUBSTATION	496	23838	2266	10095	400	189875	56519	282993
D14	OVERHEAD CONTACT SYSTEM (OCS)	4363	227879	15648	392094	28950	2713	159586	826870
TOTAL	SEG 1: SF TERMINAL ST TO 16TH ST	4,859	251,717	17,914	402,189	29,350	192,588	216,105	1,109,863
D2	SEG 2: 16TH ST YARD								
D21	INCOMING POWER	251	13109	898	15000	0	0	7252	36259
D22	TRACTION POWER SUBSTATION	2022	100715	8478	39275	900600	1127858	319085	2496011
D23	TIE- BREAKER SUBSTATION	496	23838	2266	10095	400	189875	56519	282993
D24	OVERHEAD CONTACT SYSTEM (OCS)	8692	453986	31094	449684	75300	21700	239119	1270883
TOTAL	SEG 2: 16TH ST YARD	11,461	591,648	42,736	514,054	976,300	1,339,433	621,975	4,086,146
D3	SEG 3: 16TH ST TO SAN JOSE								
D31	INCOMING POWER	1109	57923	3973	68725	0	0	32655	163276
D32	TRACTION POWER SUBSTATION	4051	201746	16994	78752	201200	2260055	639391	3398138
D33	TIE- BREAKER SUBSTATION	2329	115057	10241	48127	800	1026410	299959	1500594
D34	OVERHEAD CONTACT SYSTEM (OCS)	288124	17306171	764138	14416060	483000	0	8121599	41090968
TOTAL	SEG 3: 16TH ST TO SAN JOSE	295,613	17,680,897	795,346	14,611,664	685,000	3,286,465	9,093,604	46,152,976
D4	SEG 4: PULLMAN WAY MTN FAC SAN JOSE								
D43	TIE- BREAKER SUBSTATION	496	23838	2266	10095	400	189875	56519	282993
D44	OVERHEAD CONTACT SYSTEM (OCS)	18631	1119071	47609	708233	28600	21700	474153	2399366
TOTAL	SEG 4: PULLMAN WAY MTN FAC SAN JOSE	19,127	1,142,909	49,875	718,328	29,000	211,575	530,672	2,682,359
D5	SEG 5: SAN JOSE TO GILROY								
D51	INCOMING POWER	502	26219	1796	29998	0	0	14504	72517
D52	TRACTION POWER SUBSTATION	4047	201597	16956	78548	1200	2255715	638208	3192224
D53	TIE- BREAKER SUBSTATION	778	38412	3423	16155	400	342860	100215	501465
D54	OVERHEAD CONTACT SYSTEM (OCS)	89228	5359479	228192	4326369	291000	2713	2479193	12686946
TOTAL	SEG 5: SAN JOSE TO GILROY	94,555	5,625,707	250,367	4,451,070	292,600	2,601,288	3,232,120	16,453,152

WORK BREAKDWN FACIL.STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
TOTAL	OPTION 2 : 25KV AC Segs 1 to Seg 5	425,615	25,292,878	1,156,238	20,697,305	2,012,250	7,631,349	13,694,476	70,484,496
REPORT TOTAL		425,615	25,292,878	1,156,238	20,697,305	2,012,250	7,631,349	13,694,476	70,484,496

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
B	BASE CASE: 1500V DC Seg 1 & 2 Only									
B1	SEG 1: SF TERMINAL ST TO 16TH ST									
B11	INCOMING POWER									
B11 .1615182.PWR	2-6" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	250 LF	111	5493	682	4126	0	0	2575	12876
B11 .1631004.PWR	1/c #1/0 Xlpe 35KV Shielded Copper Cable	900 LF	30	1567	106	4883	0	0	1639	8195
B11 .1641034.PWR	1/c #1/0 35kv Termination Incl Hi-potting	6 EA	40	2089	142	521	0	0	688	3440
TOTAL	INCOMING POWER		181		930		0		4,902	
				9,149		9,530		0		24,511
B12	TRACTION POWER SUBSTATION									
B12 .0200001.PWR	Sitework/drainage	5000 SF	25	1000	0	434	0	0	359	1793
B12 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	320 LF	72	2519	282	2778	0	0	1395	6974
B12 .0342002.PWR	Concrete Foundations	40 CY	154	5745	1276	5208	0	0	3057	15286
B12 .1611022.PWR	Saw Cut Asphalt	300 LF	18	540	297	0	0	0	209	1046
B12 .1611036.PWR	AC Paving Remove & Restore	300 SF	45	1350	413	0	0	0	441	2204
B12 .1615001.PWR	Precast Manhole 6'x 6'x4'D	3 EA	40	2089	142	7161	0	0	2348	11740
B12 .1615189.PWR	12-5" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	150 LF	289	14302	1777	12064	0	0	7036	35179
B12 .1632012.PWR	1/c #750mcm EPR 5kv Cable	3600 LF	297	15512	1061	39060	0	0	13908	69541
B12 .1642012.PWR	1/c #750mcm 5kv Termination Incl Hi-potting	36 EA	317	16557	1133	3515	0	0	5301	26506
B12 .1651051.PWR	34.5 Kv Surge Arrester	3 EA	20	1045	71	0	0	4883	1500	7499
B12 .1651288.PWR	Ct/pt Cubicle For Utility Co Metering	1 EA	26	1358	94	0	0	9223	2669	13344
B12 .1651293.PWR	Pre-packaged Substation Incl 34.5kv Ac & 1500v Dc Swgr And Transformer/rectifier	1 EA	825	43090	2951	0	0	1016428	265617	1328086
B12 .1651311.PWR	Power Factor Correction - Allowance Per Substation	1 EA	44	2298	157	0	0	16275	4683	23413
B12 .1651321.PWR	Harmonic Filters Allow - Allowance Per Substation	1 EA	66	3447	236	0	0	65100	17196	85979
B12 .1661100.PWR	Substation Lighting	5000 SF	50	2612	176	1085	0	0	968	4841
B12 .1663100.PWR	Substation Grounding	5000 SF	55	2873	198	1356	0	0	1107	5534
B12 .1677301.PWR	Testing/checkout/adjust	60 MH	66	3447	236	0	0	0	921	4604
B12 .1677311.PWR	Training/manuals	6 HRS	0	0	0	326	600	0	82	1008
B12 .1677323.PWR	Spare Parts	12 $K	0	0	0	13020	0	0	3255	16275
B12 .1681000.PWR	Allowance For Corrosion Protection Of Utilities	250 $K	0	0	0	0	250000	0	0	250000

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
B12 .1681100.PWR	Allowance Pg&e Fee	250 $K	0	0	0	0	250000	0	0	250000
TOTAL	TRACTION POWER SUBSTATION		2,409	119,784	10,500	86,007	500,600	1,111,909	332,052	2,160,852
B14	OVERHEAD CONTACT SYSTEM (OCS)									
B14 .1677051.OCS	Contact Wire 4/0 Awg Copper	29600 LF	488	25488	1758	54597	0	0	20461	102304
B14 .1677056.OCS	Messenger Wire 750mcm Copper	59200 LF	3907	204064	14001	321160	0	0	134806	674031
B14 .1677108.	Pole Heavier Duty - Base Case	40 EA	1584	82733	5665	78120	0	0	41630	208148
B14 .1677118.	Pole Foundation-heavier Duty For Base Case	40 EA	1584	82733	5665	52080	0	0	35120	175598
B14 .1677130.OCS	Tunnel Support Assembly - Ocs - Heavier Duty For Base Case	260 EA	2288	119503	8183	197470	0	0	81289	406445
B14 .1677141.OCS	Catenary Hanger 4', Bronze, Including 2 - Connectors	336 EA	92	4805	330	7291	0	0	3107	15533
B14 .1677145.OCS	Potential Equalizing Jumper	134 EA	66	3447	237	7270	0	0	2739	13693
B14 .1677153.OCS	Disc Sw 1500v Dc, 2000a No Load Operation	8 EA	70	3656	252	0	0	30380	8572	42860
B14 .1677155.OCS	Section Insulator Assembly	2 EA	35	1828	126	6510	0	0	2116	10580
B14 .1677161.OCS	Cross-connect Ground Wires & Running Rails - Tunnel	11 EA	175	9140	628	7161	550	0	4232	21711
B14 .1677301.OCS	Testing/checkout/adjust	120 MH	132	6894	472	0	0	0	1842	9208
B14 .1677311.OCS	Training/manuals	14 HRS	0	0	0	760	1400	0	190	2350
B14 .1677323.OCS	Spare Parts	8 $K	0	0	0	8680	0	0	2170	10850
TOTAL	OVERHEAD CONTACT SYSTEM (OCS)		10,421	544,291	37,317	741,099	1,950	30,380	338,274	1,693,311
TOTAL	SEG 1: SF TERMINAL ST TO 16TH ST		13,011	673,224	48,747	836,636	502,550	1,142,289	675,228	3,878,674
B2	SEG 2: 16TH ST YARD									
B21	INCOMING POWER									
B21 .1615182.PWR	2-6" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	250 LF	111	5493	682	4126	0	0	2575	12876
B21 .1631004.PWR	1/c #1/0 Xlpe 35KV Shielded Copper Cable	900 LF	30	1567	106	4883	0	0	1639	8195
B21 .1641034.PWR	1/c #1/0 35kv Termination Incl Hi-potting	6 EA	40	2089	142	521	0	0	688	3440
TOTAL	INCOMING POWER		181	9,149	930	9,530	0	0	4,902	24,511
B22	TRACTION POWER SUBSTATION									
B22 .0200001.PWR	Sitework/drainage	5000 SF	25	1000	0	434	0	0	359	1793

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
B22 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	320 LF	72	2519	282	2778	0	0	1395	6974
B22 .0342002.PWR	Concrete Foundations	40 CY	154	5745	1276	5208	0	0	3057	15286
B22 .1611022.PWR	Saw Cut Asphalt	300 LF	18	540	297	0	0	0	209	1046
B22 .1611036.PWR	AC Paving Remove & Restore	300 SF	45	1350	413	0	0	0	441	2204
B22 .1615001.PWR	Precast Manhole 6'x 6'x4'D	3 EA	40	2089	142	7161	0	0	2348	11740
B22 .1615189.PWR	12-5" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	150 LF	289	14302	1777	12064	0	0	7036	35179
B22 .1632012.PWR	1/c #750mcm EPR 5kv Cable	3600 LF	297	15512	1061	39060	0	0	13908	69541
B22 .1642012.PWR	1/c #750mcm 5kv Termination Incl Hi-potting	36 EA	317	16557	1133	3515	0	0	5301	26506
B22 .1651051.PWR	34.5 Kv Surge Arrester	3 EA	20	1045	71	0	0	4883	1500	7499
B22 .1651288.PWR	Ct/pt Cubicle For Utility Co Metering	1 EA	26	1358	94	0	0	9223	2669	13344
B22 .1651293.PWR	Pre-packaged Substation Incl 34.5kv Ac & 1500v Dc Swgr And Transformer/rectifier	1 EA	825	43090	2951	0	0	1016428	265617	1328086
B22 .1651311.PWR	Power Factor Correction - Allowance Per Substation	1 EA	44	2298	157	0	0	16275	4683	23413
B22 .1651321.PWR	Harmonic Filters Allow - Allowance Per Substation	1 EA	66	3447	236	0	0	65100	17196	85979
B22 .1661100.PWR	Substation Lighting	5000 SF	50	2612	176	1085	0	0	968	4841
B22 .1663100.PWR	Substation Grounding	5000 SF	55	2873	198	1356	0	0	1107	5534
B22 .1677301.PWR	Testing/checkout/adjust	60 MH	66	3447	236	0	0	0	921	4604
B22 .1677311.PWR	Training/manuals	6 HRS	0	0	0	326	600	0	82	1008
B22 .1677323.PWR	Spare Parts	12 $K	0	0	0	13020	0	0	3255	16275
B22 .1681000.PWR	Allowance For Corrosion Protection Of Utilities	250 $K	0	0	0	0	250000	0	0	250000
B22 .1681100.PWR	Allowance Pg&e Fee	250 $K	0	0	0	0	250000	0	0	250000
TOTAL	TRACTION POWER SUBSTATION		2,409	119,784	10,500	86,007	500,600	1,111,909	332,052	2,160,852
B24	OVERHEAD CONTACT SYSTEM (OCS)									
B24 .1611001.OCS	Allowance For Pot-holing	16 EA	0	0	0	0	24000	0	0	24000
B24 .1611003.OCS	Allowance For Rerouting Of Utility Interferences	16 EA	0	0	0	0	120000	0	0	120000
B24 .1677051.OCS	Contact Wire 4/0 Awg Copper	35330 LF	700	42046	2099	65166	0	0	27328	136639
B24 .1677056.OCS	Messenger Wire 750mcm Copper	10000 LF	792	47571	2365	54250	0	0	26047	130233
B24 .1677108.OCS	Pole Heavier Duty - Base Case	215 EA	10217	613684	30451	419895	0	0	266008	1330038
B24 .1677118.OCS	Pole Foundation-heavier Duty For Base Case	215 EA	10217	613684	30451	279930	0	0	231016	1155081
B24 .1677121.OCS	Down Guy Assembly	78 EA	412	24747	1228	16926	0	0	10725	53626
B24 .1677123.OCS	Down Guy Foundn 3'dia X 8'd	78 EA	1236	74240	3683	33852	0	0	27944	139719
B24 .1677139.OCS	Head Span Assembly	109 EA	1727	103732	5146	212877	0	0	80439	402194
B24 .1677149.OCS	Catenary Pole Grounding	44 EA	44	2643	130	573	0	0	837	4183

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
B24 .1677153.OCS	Disc Sw 1500v Dc, 2000a No Load Operation	10 EA	106	6367	315	0	0	37975	11164	55821
B24 .1677155.OCS	Section Insulator Assembly	2 EA	42	2523	126	6510	0	0	2290	11449
B24 .1677159.OCS	Cross -Connect Ground Wires & Running Rails-outside Tunnel	18 EA	691	41505	2060	22460	0	0	16506	82531
B24 .1677301.OCS	Testing/checkout/adjust	650 MH	858	51536	2558	0	0	0	13524	67618
B24 .1677311.OCS	Training/manuals	65 HRS	0	0	0	3526	6500	0	882	10908
B24 .1677323.OCS	Spare Parts	31 $K	0	0	0	33635	0	0	8409	42044
TOTAL	OVERHEAD CONTACT SYSTEM (OCS)		27,042	1,624,278	80,612	1,149,600	150,500	37,975	723,119	3,766,084
TOTAL	SEG 2: 16TH ST YARD		29,632	1,753,211	92,042	1,245,137	651,100	1,149,884	1,060,073	5,951,447
TOTAL	BASE CASE: 1500V DC Seg 1 & 2 Only		42,643	2,426,435	140,789	2,081,773	1,153,650	2,292,173	1,735,301	9,830,121
REPORT TOTAL			42,643	2,426,435	140,789	2,081,773	1,153,650	2,292,173	1,735,301	9,830,121

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
C	OPTION 1 : 25KV AC Segs 1 & Seg 2									
C1	SEG 1: SF TERMINAL ST TO 16TH ST									
C13	TIE- BREAKER SUBSTATION									
C13 .0200001.PWR	Sitework/drainage	1800 SF	9	360	0	156	0	0	129	645
C13 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	175 LF	39	1364	154	1519	0	0	759	3796
C13 .0342002.PWR	Concrete Foundations	8 CY	31	1156	255	1042	0	0	613	3066
C13 .1611022.PWR	Saw Cut Asphalt	100 LF	6	180	99	0	0	0	70	349
C13 .1611036.PWR	AC Paving Remove & Restore	150 SF	23	690	206	0	0	0	224	1120
C13 .1615145.PWR	6-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	80 LF	65	3217	401	1942	0	0	1390	6950
C13 .1631008.PWR	1/c #500mcm Xple 28kv Shld Copper Cable	480 LF	29	1515	104	3515	0	0	1284	6418
C13 .1641008.PWR	1/c #500 28kv Termination Including Hi-pot Testing	8 EA	62	3238	220	825	0	0	1071	5354
C13 .1651299.PWR	Tie Breaker Substation 25 Kv 2-bkrs, Bus Pts, Pwr Cont Rm Batteries & Acfcessories	1 EA	176	9193	630	0	0	184450	48568	242841
C13 .1661100.PWR	Substation Lighting	1800 SF	18	940	63	391	0	0	349	1743
C13 .1663100.PWR	Substation Grounding	1800 SF	20	1045	71	488	0	0	401	2005
C13 .1677301.PWR	Testing/checkout/adjust	16 MH	18	940	63	0	0	0	251	1254
C13 .1677311.PWR	Training/manuals	4 HRS	0	0	0	217	400	0	54	671
C13 .1677321.PWR	Spare Parts	5 $K	0	0	0	0	0	5425	1356	6781
TOTAL	TIE- BREAKER SUBSTATION		496	23,838	2,266	10,095	400	189,875	56,519	282,993
C14	OVERHEAD CONTACT SYSTEM (OCS)									
C14 .1611001.OCS	Allowance For Pot-holing	3 EA	0	0	0	0	4500	0	0	4500
C14 .1611003.OCS	Allowance For Rerouting Of Utility Interferences	3 EA	0	0	0	0	22500	0	0	22500
C14 .1677051.OCS	Contact Wire 4/0 Awg Copper	29600 LF	488	25488	1758	54597	0	0	20461	102304
C14 .1677055.OCS	Messenger Wire 350mcm Copper	29600 LF	651	34002	2344	96348	0	0	33174	165868
C14 .1677059.OCS	Return Wire 4/0 Awg Acsr	29600 LF	488	25488	1758	21197	0	0	12111	60554
C14 .1677129.OCS	Tunnel Support Assembly - Ocs	336 EA	2218	115847	7932	182280	0	0	76515	382574
C14 .1677141.OCS	Catenary Hanger 4', Bronze, Including 2 - Connectors	336 EA	92	4805	330	7291	0	0	3107	15533
C14 .1677145.OCS	Potential Equalizing Jumper	134 EA	66	3447	237	7270	0	0	2739	13693
C14 .1677151.OCS	25kv Disconnect Sw Assembly	1 EA	18	940	63	0	0	2713	929	4645
C14 .1677155.OCS	Section Insulator Assembly	2 EA	35	1828	126	6510	0	0	2116	10580
C14 .1677161.OCS	Cross-connect Ground Wires & Running Rails - Tunnel	11 EA	175	9140	628	7161	550	0	4232	21711
C14 .1677301.OCS	Testing/checkout/adjust	120 MH	132	6894	472	0	0	0	1842	9208

--WORK BREAKDOWN--- FACIL.	STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
C14	.1677311.OCS	Training/manuals	14 HRS	0	0	0	760	1400	0	190	2350
C14	.1677323.OCS	Spare Parts	8 $K	0	0	0	8680	0	0	2170	10850
	TOTAL	OVERHEAD CONTACT SYSTEM (OCS)		4,363		15,648		28,950		159,586	
					227,879		392,094		2,713		826,870
	TOTAL	SEG 1: SF TERMINAL ST TO 16TH ST		4,859		17,914		29,350		216,105	
					251,717		402,189		192,588		1,109,863
C2		SEG 2: 16TH ST YARD									
C21		INCOMING POWER									
C21	.1613009.PWR	65'Wood Pole 115kv W/crossarm Insulators, & Hardware	6 EA	132	6894	472	9765	0	0	4283	21414
C21	.1613025.PWR	115kv Dead-end Structure Incl Crossarms, Hardware & Insulators	1 EA	53	2768	189	3798	0	0	1689	8444
C21	.1613108.PWR	#4/0 Acsr Conductor	2000 LF	44	2298	158	1437	0	0	973	4866
C21	.1677301.PWR	Testing/checkout/adjust	20 MH	22	1149	79	0	0	0	307	1535
	TOTAL	INCOMING POWER		251		898		0		7,252	
					13,109		15,000		0		36,259
C22		TRACTION POWER SUBSTATION									
C22	.0200001.PWR	Sitework/drainage	6000 SF	30	1200	0	521	0	0	430	2151
C22	.0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	320 LF	72	2519	282	2778	0	0	1395	6974
C22	.0342002.PWR	Concrete Foundations	36 CY	139	5185	1148	4687	0	0	2755	13775
C22	.1611022.PWR	Saw Cut Asphalt	120 LF	7	210	119	0	0	0	82	411
C22	.1611036.PWR	AC Paving Remove & Restore	180 SF	27	810	248	0	0	0	265	1323
C22	.1615001.PWR	Precast Manhole 6'x 6'x4'D	3 EA	40	2089	142	7161	0	0	2348	11740
C22	.1615102.PWR	3-2" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	50 LF	14	693	88	367	0	0	287	1435
C22	.1615149.PWR	12-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	100 LF	152	7522	934	4599	0	0	3264	16319
C22	.1622400.PWR	Allow For Bus Supports, Equip Interconn's & Controls At Ea Substation	1 EA	33	1724	118	4883	0	0	1681	8406
C22	.1631008.PWR	1/c #500mcm Xple 28kv Shld Copper Cable	1280 LF	77	4022	277	9374	0	0	3418	17091
C22	.1641008.PWR	1/c #500 28kv Termination Including Hi-pot Testing	16 EA	123	6424	441	1649	0	0	2129	10643
C22	.1651052.PWR	115kv Surge Arrester	3 EA	26	1358	94	0	0	6510	1991	9953
C22	.1651201.PWR	115kv Circuit Switcher, 1200a	1 EA	53	2768	189	0	0	48825	12946	64728

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
C22 .1651284.PWR	20/26.6/35.4 MVA Transformer 115kv/25kv, Oil-filled (Scott Connected)	1 EA	550	28727	1967	0	0	488250	129736	648680
C22 .1651288.PWR	Ct/pt Cubicle For Utility Co Metering	1 EA	26	1358	94	0	0	9223	2669	13344
C22 .1651291.PWR	Traction Pwr Substation 25 Kv W/ Bkrs, Pts, Fused Disc Sws Cont Rm Pwr,batteries & Misc	1 EA	352	18385	1259	0	0	482825	125617	628086
C22 .1651311.PWR	Power Factor Correction - Allowance Per Substation	1 EA	44	2298	157	0	0	16275	4683	23413
C22 .1651321.PWR	Harmonic Filters Allow - Allowance Per Substation	1 EA	66	3447	236	0	0	65100	17196	85979
C22 .1661100.PWR	Substation Lighting	6000 SF	59	3082	211	1302	0	0	1149	5744
C22 .1663100.PWR	Substation Grounding	6000 SF	66	3447	238	1628	0	0	1328	6641
C22 .1677301.PWR	Testing/checkout/adjust	60 MH	66	3447	236	0	0	0	921	4604
C22 .1677311.PWR	Training/manuals	6 HRS	0	0	0	326	600	0	82	1008
C22 .1677321.PWR	Spare Parts	10 $K	0	0	0	0	0	10850	2713	13563
C22 .1681100.PWR	Allowance Pg&e Fee	900 $K	0	0	0	0	900000	0	0	900000
TOTAL	TRACTION POWER SUBSTATION		2,022	100,715	8,478	39,275	900,600	1,127,858	319,085	2,496,011
C23	TIE- BREAKER SUBSTATION									
C23 .0200001.PWR	Sitework/drainage	1800 SF	9	360	0	156	0	0	129	645
C23 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	175 LF	39	1364	154	1519	0	0	759	3796
C23 .0342002.PWR	Concrete Foundations	8 CY	31	1156	255	1042	0	0	613	3066
C23 .1611022.PWR	Saw Cut Asphalt	100 LF	6	180	99	0	0	0	70	349
C23 .1611036.PWR	AC Paving Remove & Restore	150 SF	23	690	206	0	0	0	224	1120
C23 .1615145.PWR	6-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	80 LF	65	3217	401	1942	0	0	1390	6950
C23 .1631008.PWR	1/c #500mcm Xple 28kv Shld Copper Cable	480 LF	29	1515	104	3515	0	0	1284	6418
C23 .1641008.PWR	1/c #500 28kv Termination Including Hi-pot Testing	8 EA	62	3238	220	825	0	0	1071	5354
C23 .1651299.PWR	Tie Breaker Substation 25 Kv 2-bkrs, Bus Pts, Pwr Cont Rm Batteries & Acfcessories	1 EA	176	9193	630	0	0	184450	48568	242841
C23 .1661100.PWR	Substation Lighting	1800 SF	18	940	63	391	0	0	349	1743
C23 .1663100.PWR	Substation Grounding	1800 SF	20	1045	71	488	0	0	401	2005
C23 .1677301.PWR	Testing/checkout/adjust	16 MH	18	940	63	0	0	0	251	1254
C23 .1677311.PWR	Training/manuals	4 HRS	0	0	0	217	400	0	54	671
C23 .1677321.PWR	Spare Parts	5 $K	0	0	0	0	0	5425	1356	6781

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
TOTAL	TIE- BREAKER SUBSTATION		496		2,266		400		56,519	
				23,838		10,095		189,875		282,993
C24	OVERHEAD CONTACT SYSTEM (OCS)									
C24 .1677051.OCS	Contact Wire 4/0 Awg Copper	35330 LF	700	42046	2099	65166	0	0	27328	136639
C24 .1677059.OCS	Return Wire 4/0 Awg Acsr	6000 LF	119	7148	356	4297	0	0	2950	14751
C24 .1677105.OCS	Pole W10x49x30'	106 EA	3358	201698	10009	138012	0	0	87430	437149
C24 .1677107.OCS	Pole W12x53x30'	109 EA	4316	259241	12865	177398	0	0	112376	561880
C24 .1677115.OCS	Pole Foundation 3'dia X 12'd	106 EA	2519	151304	7507	67856	0	0	56667	283334
C24 .1677117.OCS	Pole Foundation 3.5'diax14'd	109 EA	4316	259241	12865	112352	0	0	96115	480573
C24 .1677121.OCS	Down Guy Assembly	78 EA	412	24747	1228	16926	0	0	10725	53626
C24 .1677123.OCS	Down Guy Foundn 3'dia X 8'd	78 EA	1236	74240	3683	33852	0	0	27944	139719
C24 .1677139.OCS	Head Span Assembly	109 EA	1727	103732	5146	212877	0	0	80439	402194
C24 .1677149.OCS	Catenary Pole Grounding	44 EA	44	2643	130	573	0	0	837	4183
C24 .1677151.OCS	25kv Disconnect Sw Assembly	16 EA	338	20302	1007	0	0	43400	16177	80886
C24 .1677159.OCS	Cross -Connect Ground Wires & Running Rails-outside Tunnel	18 EA	691	41505	2060	22460	0	0	16506	82531
C24 .1677301.OCS	Testing/checkout/adjust	650 MH	858	51536	2558	0	0	0	13524	67618
C24 .1677311.OCS	Training/manuals	65 HRS	0	0	0	3526	6500	0	882	10908
C24 .1677323.OCS	Spare Parts	31 $K	0	0	0	33635	0	0	8409	42044
TOTAL	OVERHEAD CONTACT SYSTEM (OCS)		20,634		61,513		6,500		558,309	
				1,239,383		888,930		43,400		2,798,035
TOTAL	SEG 2: 16TH ST YARD		23,403		73,155		907,500		941,165	
				1,377,045		953,300		1,361,133		5,613,298
TOTAL	OPTION 1 : 25KV AC Segs 1 & Seg 2		28,262		91,069		936,850		1,157,270	
				1,628,762		1,355,489		1,553,721		6,723,161
REPORT TOTAL			28,262		91,069		936,850		1,157,270	
				1,628,762		1,355,489		1,553,721		6,723,161

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D	OPTION 2 : 25KV AC Segs 1 to Seg 5									
D1	SEG 1: SF TERMINAL ST TO 16TH ST									
D13	TIE- BREAKER SUBSTATION									
D13 .0200001.PWR	Sitework/drainage	1800 SF	9	360	0	156	0	0	129	645
D13 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	175 LF	39	1364	154	1519	0	0	759	3796
D13 .0342002.PWR	Concrete Foundations	8 CY	31	1156	255	1042	0	0	613	3066
D13 .1611022.PWR	Saw Cut Asphalt	100 LF	6	180	99	0	0	0	70	349
D13 .1611036.PWR	AC Paving Remove & Restore	150 SF	23	690	206	0	0	0	224	1120
D13 .1615145.PWR	6-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	80 LF	65	3217	401	1942	0	0	1390	6950
D13 .1631008.PWR	1/c #500mcm Xple 28kv Shld Copper Cable	480 LF	29	1515	104	3515	0	0	1284	6418
D13 .1641008.PWR	1/c #500 28kv Termination Including Hi-pot Testing	8 EA	62	3238	220	825	0	0	1071	5354
D13 .1651299.PWR	Tie Breaker Substation 25 Kv 2-bkrs, Bus Pts, Pwr Cont Rm Batteries & Acfcessories	1 EA	176	9193	630	0	0	184450	48568	242841
D13 .1661100.PWR	Substation Lighting	1800 SF	18	940	63	391	0	0	349	1743
D13 .1663100.PWR	Substation Grounding	1800 SF	20	1045	71	488	0	0	401	2005
D13 .1677301.PWR	Testing/checkout/adjust	16 MH	18	940	63	0	0	0	251	1254
D13 .1677311.PWR	Training/manuals	4 HRS	0	0	0	217	400	0	54	671
D13 .1677321.PWR	Spare Parts	5 $K	0	0	0	0	0	5425	1356	6781
TOTAL	TIE- BREAKER SUBSTATION		496	23,838	2,266	10,095	400	189,875	56,519	282,993
D14	OVERHEAD CONTACT SYSTEM (OCS)									
D14 .1611001.OCS	Allowance For Pot-holing	3 EA	0	0	0	0	4500	0	0	4500
D14 .1611003.OCS	Allowance For Rerouting Of Utility Interferences	3 EA	0	0	0	0	22500	0	0	22500
D14 .1677051.OCS	Contact Wire 4/0 Awg Copper	29600 LF	488	25488	1758	54597	0	0	20461	102304
D14 .1677055.OCS	Messenger Wire 350mcm Copper	29600 LF	651	34002	2344	96348	0	0	33174	165868
D14 .1677059.OCS	Return Wire 4/0 Awg Acsr	29600 LF	488	25488	1758	21197	0	0	12111	60554
D14 .1677129.OCS	Tunnel Support Assembly - Ocs	336 EA	2218	115847	7932	182280	0	0	76515	382574
D14 .1677141.OCS	Catenary Hanger 4', Bronze, Including 2 - Connectors	336 EA	92	4805	330	7291	0	0	3107	15533
D14 .1677145.OCS	Potential Equalizing Jumper	134 EA	66	3447	237	7270	0	0	2739	13693
D14 .1677151.OCS	25kv Disconnect Sw Assembly	1 EA	18	940	63	0	0	2713	929	4645
D14 .1677155.OCS	Section Insulator Assembly	2 EA	35	1828	126	6510	0	0	2116	10580
D14 .1677161.OCS	Cross-connect Ground Wires & Running Rails - Tunnel	11 EA	175	9140	628	7161	550	0	4232	21711
D14 .1677301.OCS	Testing/checkout/adjust	120 MH	132	6894	472	0	0	0	1842	9208

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D14		.1677311.OCS	Training/manuals	14 HRS	0	0	0	760	1400	0	190	2350
D14		.1677323.OCS	Spare Parts	8 $K	0	0	0	8680	0	0	2170	10850
	TOTAL		OVERHEAD CONTACT SYSTEM (OCS)		4,363		15,648		28,950		159,586	
						227,879		392,094		2,713		826,870
	TOTAL		SEG 1: SF TERMINAL ST TO 16TH ST		4,859		17,914		29,350		216,105	
						251,717		402,189		192,588		1,109,863
D2			SEG 2: 16TH ST YARD									
D21			INCOMING POWER									
D21		.1613009.PWR	65'wood Pole 115kv W/crossarm Insulators, & Hardware	6 EA	132	6894	472	9765	0	0	4283	21414
D21		.1613025.PWR	115kv Dead-end Structure Incl Crossarms, Hardware & Insulators	1 EA	53	2768	189	3798	0	0	1689	8444
D21		.1613108.PWR	#4/0 Acsr Conductor	2000 LF	44	2298	158	1437	0	0	973	4866
D21		.1677301.PWR	Testing/checkout/adjust	20 MH	22	1149	79	0	0	0	307	1535
	TOTAL		INCOMING POWER		251		898		0		7,252	
						13,109		15,000		0		36,259
D22			TRACTION POWER SUBSTATION									
D22		.0200001.PWR	Sitework/drainage	6000 SF	30	1200	0	521	0	0	430	2151
D22		.0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	320 LF	72	2519	282	2778	0	0	1395	6974
D22		.0342002.PWR	Concrete Foundations	36 CY	139	5185	1148	4687	0	0	2755	13775
D22		.1611022.PWR	Saw Cut Asphalt	120 LF	7	210	119	0	0	0	82	411
D22		.1611036.PWR	AC Paving Remove & Restore	180 SF	27	810	248	0	0	0	265	1323
D22		.1615001.PWR	Precast Manhole 6'x 6'x4'D	3 EA	40	2089	142	7161	0	0	2348	11740
D22		.1615102.PWR	3-2" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	50 LF	14	693	88	367	0	0	287	1435
D22		.1615149.PWR	12-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	100 LF	152	7522	934	4599	0	0	3264	16319
D22		.1622400.PWR	Allow For Bus Supports, Equip Interconn's & Controls At Ea Substation	1 EA	33	1724	118	4883	0	0	1681	8406
D22		.1631008.PWR	1/c #500mcm Xple 28kv Shld Copper Cable	1280 LF	77	4022	277	9374	0	0	3418	17091
D22		.1641008.PWR	1/c #500 28kv Termination Including Hi-pot Testing	16 EA	123	6424	441	1649	0	0	2129	10643
D22		.1651052.PWR	115kv Surge Arrester	3 EA	26	1358	94	0	0	6510	1991	9953
D22		.1651201.PWR	115kv Circuit Switcher, 1200a	1 EA	53	2768	189	0	0	48825	12946	64728

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D22 .1651284.PWR	20/26.6/35.4 MVA Transformer 115kv/25kv, Oil-filled (Scott Connected)	1 EA	550	28727	1967	0	0	488250	129736	648680
D22 .1651288.PWR	Ct/pt Cubicle For Utility Co Metering	1 EA	26	1358	94	0	0	9223	2669	13344
D22 .1651291.PWR	Traction Pwr Substation 25 Kv W/ Bkrs, Pts, Fused Disc Sws Cont Rm Pwr,batteries & Misc	1 EA	352	18385	1259	0	0	482825	125617	628086
D22 .1651311.PWR	Power Factor Correction - Allowance Per Substation	1 EA	44	2298	157	0	0	16275	4683	23413
D22 .1651321.PWR	Harmonic Filters Allow - Allowance Per Substation	1 EA	66	3447	236	0	0	65100	17196	85979
D22 .1661100.PWR	Substation Lighting	6000 SF	59	3082	211	1302	0	0	1149	5744
D22 .1663100.PWR	Substation Grounding	6000 SF	66	3447	238	1628	0	0	1328	6641
D22 .1677301.PWR	Testing/checkout/adjust	60 MH	66	3447	236	0	0	0	921	4604
D22 .1677311.PWR	Training/manuals	6 HRS	0	0	0	326	600	0	82	1008
D22 .1677321.PWR	Spare Parts	10 $K	0	0	0	0	0	10850	2713	13563
D22 .1681100.PWR	Allowance Pg&e Fee	900 $K	0	0	0	0	900000	0	0	900000
TOTAL	TRACTION POWER SUBSTATION		2,022	100,715	8,478	39,275	900,600	1,127,858	319,085	2,496,011
D23	TIE- BREAKER SUBSTATION									
D23 .0200001.PWR	Sitework/drainage	1800 SF	9	360	0	156	0	0	129	645
D23 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	175 LF	39	1364	154	1519	0	0	759	3796
D23 .0342002.PWR	Concrete Foundations	8 CY	31	1156	255	1042	0	0	613	3066
D23 .1611022.PWR	Saw Cut Asphalt	100 LF	6	180	99	0	0	0	70	349
D23 .1611036.PWR	AC Paving Remove & Restore	150 SF	23	690	206	0	0	0	224	1120
D23 .1615145.PWR	6-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	80 LF	65	3217	401	1942	0	0	1390	6950
D23 .1631008.PWR	1/c #500mcm Xple 28kv Shld Copper Cable	480 LF	29	1515	104	3515	0	0	1284	6418
D23 .1641008.PWR	1/c #500 28kv Termination Including Hi-pot Testing	8 EA	62	3238	220	825	0	0	1071	5354
D23 .1651299.PWR	Tie Breaker Substation 25 Kv 2-bkrs, Bus Pts, Pwr Cont Rm Batteries & Acfcessories	1 EA	176	9193	630	0	0	184450	48568	242841
D23 .1661100.PWR	Substation Lighting	1800 SF	18	940	63	391	0	0	349	1743
D23 .1663100.PWR	Substation Grounding	1800 SF	20	1045	71	488	0	0	401	2005
D23 .1677301.PWR	Testing/checkout/adjust	16 MH	18	940	63	0	0	0	251	1254
D23 .1677311.PWR	Training/manuals	4 HRS	0	0	0	217	400	0	54	671
D23 .1677321.PWR	Spare Parts	5 $K	0	0	0	0	0	5425	1356	6781

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG		DESCRIPTION	QUANTITY		MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
	TOTAL	TIE- BREAKER SUBSTATION			496	23,838	2,266	10,095	400	189,875	56,519	282,993
D24		OVERHEAD CONTACT SYSTEM (OCS)										
D24	.1611001.OCS	Allowance For Pot-holing	8	EA	0	0	0	0	12000	0	0	12000
D24	.1611003.OCS	Allowance For Rerouting Of Utility Interferences	8	EA	0	0	0	0	60000	0	0	60000
D24	.1677051.OCS	Contact Wire 4/0 Awg Copper	17870	LF	295	15408	1061	32961	0	0	12358	61788
D24	.1677059.OCS	Return Wire 4/0 Awg Acsr	3035	LF	50	2612	180	2173	0	0	1241	6206
D24	.1677105.OCS	Pole W10x49x30'	54	EA	1426	74481	5099	70308	0	0	37472	187360
D24	.1677107.OCS	Pole W12x53x30'	55	EA	1815	94798	6492	89513	0	0	47701	238504
D24	.1677115.OCS	Pole Foundation 3'dia X 12'd	54	EA	1069	55834	3824	34568	0	0	23557	117783
D24	.1677117.OCS	Pole Foundation 3.5'diax14'd	55	EA	1815	94798	6492	56691	0	0	39495	197476
D24	.1677121.OCS	Down Guy Assembly	39	EA	172	8984	614	8463	0	0	4515	22576
D24	.1677123.OCS	Down Guy Foundn 3'dia X 8'd	39	EA	515	26899	1841	16926	0	0	11417	57083
D24	.1677139.OCS	Head Span Assembly	55	EA	726	37919	2597	107415	0	0	36983	184914
D24	.1677149.OCS	Catenary Pole Grounding	22	EA	18	940	65	286	0	0	323	1614
D24	.1677151.OCS	25kv Disconnect Sw Assembly	8	EA	141	7364	504	0	0	21700	7392	36960
D24	.1677159.OCS	Cross -Connect Ground Wires & Running Rails-outside Tunnel	9	EA	288	15042	1030	11230	0	0	6826	34128
D24	.1677301.OCS	Testing/checkout/adjust	329	MH	362	18907	1295	0	0	0	5051	25253
D24	.1677311.OCS	Training/manuals	33	HRS	0	0	0	1790	3300	0	448	5538
D24	.1677323.OCS	Spare Parts	16	$K	0	0	0	17360	0	0	4340	21700
	TOTAL	OVERHEAD CONTACT SYSTEM (OCS)			8,692	453,986	31,094	449,684	75,300	21,700	239,119	1,270,883
	TOTAL	SEG 2: 16TH ST YARD			11,461	591,648	42,736	514,054	976,300	1,339,433	621,975	4,086,146
D3		SEG 3: 16TH ST TO SAN JOSE										
D31		INCOMING POWER										
D31	.1613009.PWR	65'Wood Pole 115kv W/crossarm Insulators, & Hardware	32	EA	704	36770	2518	52080	0	0	22842	114210
D31	.1613025.PWR	115kv Dead-end Structure Incl Crossarms, Hardware & Insulators	2	EA	106	5536	378	7595	0	0	3377	16886
D31	.1613108.PWR	#4/0 Acsr Conductor	12600	LF	277	14468	998	9050	0	0	6129	30645
D31	.1677301.PWR	Testing/checkout/adjust	20	MH	22	1149	79	0	0	0	307	1535
	TOTAL	INCOMING POWER			1,109	57,923	3,973	68,725	0	0	32,655	163,276
D32		TRACTION POWER SUBSTATION										

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D32 .0200001.PWR	Sitework/drainage	12000 SF	60	2400	0	1042	0	0	861	4303
D32 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	640 LF	144	5038	564	5555	0	0	2789	13946
D32 .0342002.PWR	Concrete Foundations	73 CY	281	10483	2328	9505	0	0	5579	27895
D32 .1611022.PWR	Saw Cut Asphalt	241 LF	14	420	239	0	0	0	165	824
D32 .1611036.PWR	AC Paving Remove & Restore	362 SF	54	1620	498	0	0	0	530	2648
D32 .1615001.PWR	Precast Manhole 6'x 6'x4'D	6 EA	79	4126	283	14322	0	0	4683	23414
D32 .1615102.PWR	3-2" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	100 LF	29	1435	176	735	0	0	587	2933
D32 .1615149.PWR	12-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	200 LF	304	15044	1868	9198	0	0	6528	32638
D32 .1622400.PWR	Allow For Bus Supports, Equip Interconn's & Controls At Ea Substation	2 EA	66	3447	236	9765	0	0	3362	16810
D32 .1631008.PWR	1/c #500mcm Xple 28kv Shld Copper Cable	2570 LF	155	8096	557	18822	0	0	6869	34344
D32 .1641008.PWR	1/c #500 28kv Termination Including Hi-pot Testing	32 EA	246	12849	881	3298	0	0	4257	21285
D32 .1651052.PWR	115kv Surge Arrester	6 EA	53	2768	189	0	0	13020	3994	19971
D32 .1651201.PWR	115kv Circuit Switcher, 1200a	2 EA	106	5536	378	0	0	97650	25891	129455
D32 .1651284.PWR	20/26.6/35.4 MVA Transformer 115kv/25kv, Oil-filled (Scott Connected)	2 EA	1100	57453	3934	0	0	976500	259472	1297359
D32 .1651288.PWR	Ct/pt Cubicle For Utility Co Metering	2 EA	53	2768	189	0	0	18445	5351	26753
D32 .1651291.PWR	Traction Pwr Substation 25 Kv W/ Bkrs, Pts, Fused Disc Sws Cont Rm Pwr,batteries & Misc	2 EA	704	36770	2518	0	0	965650	251235	1256173
D32 .1651311.PWR	Power Factor Correction - Allowance Per Substation	2 EA	88	4596	315	0	0	32550	9365	46826
D32 .1651321.PWR	Harmonic Filters Allow - Allowance Per Substation	2 EA	132	6894	472	0	0	130200	34392	171958
D32 .1661100.PWR	Substation Lighting	12000 SF	119	6215	422	2604	0	0	2310	11551
D32 .1663100.PWR	Substation Grounding	12000 SF	132	6894	475	3255	0	0	2656	13280
D32 .1677301.PWR	Testing/checkout/adjust	120 MH	132	6894	472	0	0	0	1842	9208
D32 .1677311.PWR	Training/manuals	12 HRS	0	0	0	651	1200	0	163	2014
D32 .1677321.PWR	Spare Parts	24 $K	0	0	0	0	0	26040	6510	32550
D32 .1681100.PWR	Allowance Pg&e Fee	200 $K	0	0	0	0	200000	0	0	200000
TOTAL	TRACTION POWER SUBSTATION		4,051	201,746	16,994	78,752	201,200	2,260,055	639,391	3,398,138
D33	TIE- BREAKER SUBSTATION									
D33 .0200001.PWR	Sitework/drainage	5400 SF	27	1080	0	469	0	0	387	1936
D33 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	520 LF	117	4093	458	4514	0	0	2266	11331

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D33	.0342002.	PWR	Concrete Foundations	23 CY	89	3320	734	2995	0	0	1762	8811
D33	.1611022.	PWR	Saw Cut Asphalt	300 LF	18	540	297	0	0	0	209	1046
D33	.1611036.	PWR	AC Paving Remove & Restore	450 SF	68	2040	619	0	0	0	665	3324
D33	.1615149.	PWR	12-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	240 LF	364	18013	2242	11038	0	0	7823	39116
D33	.1631008.	PWR	1/c #500mcm Xple 28kv Shld Copper Cable	2880 LF	174	9088	624	21092	0	0	7701	38505
D33	.1641008.	PWR	1/c #500 28kv Termination Including Hi-pot Testing	48 EA	370	19325	1322	4948	0	0	6399	31994
D33	.1651298.	PWR	Tie Breaker Substation 25 Kv 5-bkrs, Bus Pts, Pwr Cont Rm Batteries & Accessories	3 EA	924	48261	3305	0	0	1009050	265154	1325770
D33	.1661100.	PWR	Substation Lighting	5400 SF	53	2768	190	1172	0	0	1033	5163
D33	.1663100.	PWR	Substation Grounding	5400 SF	59	3082	214	1465	0	0	1190	5951
D33	.1677301.	PWR	Testing/checkout/adjust	60 MH	66	3447	236	0	0	0	921	4604
D33	.1677311.	PWR	Training/manuals	8 HRS	0	0	0	434	800	0	109	1343
D33	.1677321.	PWR	Spare Parts	16 $K	0	0	0	0	0	17360	4340	21700
	TOTAL		TIE- BREAKER SUBSTATION		2,329	115,057	10,241	48,127	800	1,026,410	299,959	1,500,594
D34			OVERHEAD CONTACT SYSTEM (OCS)									
D34	.1611001.	OCS	Allowance For Pot-holing	52 EA	0	0	0	0	78000	0	0	78000
D34	.1611003.	OCS	Allowance For Rerouting Of Utility Interferences	52 EA	0	0	0	0	390000	0	0	390000
D34	.1677051.	OCS	Contact Wire 4/0 Awg Copper	616810 LF	13739	825233	36639	1137706	0	0	499895	2499473
D34	.1677055.	OCS	Messenger Wire 350mcm Copper	616810 LF	18319	1100331	48851	2007717	0	0	789225	3946124
D34	.1677059.	OCS	Return Wire 4/0 Awg Acsr	616810 LF	13739	825233	36639	441698	0	0	325893	1629463
D34	.1677101.	OCS	Pole W8x31x30'	1434 EA	34071	2046475	90268	1166918	0	0	825915	4129576
D34	.1677103.	OCS	Pole W10x39x30'	637 EA	17973	1079548	47617	656588	0	0	445938	2229691
D34	.1677105.	OCS	Pole W10x49x30'	637 EA	22703	1363656	60147	829374	0	0	563294	2816471
D34	.1677107.	OCS	Pole W12x53x30'	478 EA	21295	1279084	56418	777945	0	0	528362	2641809
D34	.1677111.	OCS	Pole Foundation 3'dia X 8'd	1434 EA	25554	1534901	67702	622356	0	0	556240	2781199
D34	.1677113.	OCS	Pole Foundation 3'dia X 10'd	637 EA	14189	852262	37593	338661	0	0	307129	1535645
D34	.1677115.	OCS	Pole Foundation 3'dia X 12'd	637 EA	17027	1022727	45111	407776	0	0	368904	1844518
D34	.1677117.	OCS	Pole Foundation 3.5'diax14'd	478 EA	21295	1279084	56418	492699	0	0	457050	2285251
D34	.1677121.	OCS	Down Guy Assembly	448 EA	2661	159833	7050	97216	0	0	66025	330124
D34	.1677123.	OCS	Down Guy Foundn 3'dia X 8'd	448 EA	7983	479499	21151	194432	0	0	173771	868853
D34	.1677125.	OCS	Cantilever Arm Push-off Complete Assembly (medium)	2175 EA	19379	1164000	51343	1415925	0	0	657817	3289085
D34	.1677127.	OCS	Cantilever Arm Pull-off Complete Assembly (heavy)	1170 EA	10425	626178	27619	1142505	0	0	449076	2245378
D34	.1677131.	OCS	Counterweight Arrangement - Auto-tensioned Assembly	224 EA	7983	479499	21151	1579760	0	0	520103	2600513
D34	.1677135.	OCS	Simple Catenary Termination Assembly, Auto-tensioned	224 EA	1996	119890	5288	243040	0	0	92055	460273

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D34	.1677137.	OCS	Mid-point Anchor Assembly Auto-tensioned	112 EA	1331	79947	3525	145824	0	0	57324	286620
D34	.1677141.	OCS	Catenary Hanger 4', Bronze, Including 2 - Connectors	3186 EA	1183	71057	3133	69136	0	0	35832	179158
D34	.1677145.	OCS	Potential Equalizing Jumper	2804 EA	1874	112562	4963	152117	0	0	67411	337053
D34	.1677147.	OCS	Full Feed Jumper Set	110 EA	245	14716	649	13129	0	0	7124	35618
D34	.1677149.	OCS	Catenary Pole Grounding	638 EA	711	42706	1882	8307	0	0	13224	66119
D34	.1677155.	OCS	Section Insulator Assembly	12 EA	285	17119	755	39060	0	0	14234	71168
D34	.1677159.	OCS	Cross -Connect Ground Wires & Running Rails-outside Tunnel	230 EA	9936	596806	26324	286983	0	0	227528	1137641
D34	.1677301.	OCS	Testing/checkout/adjust	1500 MH	2228	133825	5902	0	0	0	34932	174659
D34	.1677311.	OCS	Training/manuals	150 HRS	0	0	0	8138	15000	0	2035	25173
D34	.1677323.	OCS	Spare Parts	130 $K	0	0	0	141050	0	0	35263	176313
	TOTAL		OVERHEAD CONTACT SYSTEM (OCS)		288,124	764,138		483,000		8,121,599		
						17,306,171		14,416,060		0		41,090,968
	TOTAL		SEG 3: 16TH ST TO SAN JOSE		295,613	795,346		685,000		9,093,604		
						17,680,897		14,611,664		3,286,465		46,152,976
D4			SEG 4: PULLMAN WAY MTN FAC SAN JOSE									
D43			TIE- BREAKER SUBSTATION									
D43	.0200001.	PWR	Sitework/drainage	1800 SF	9	360	0	156	0	0	129	645
D43	.0271128.	PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	175 LF	39	1364	154	1519	0	0	759	3796
D43	.0342002.	PWR	Concrete Foundations	8 CY	31	1156	255	1042	0	0	613	3066
D43	.1611022.	PWR	Saw Cut Asphalt	100 LF	6	180	99	0	0	0	70	349
D43	.1611036.	PWR	AC Paving Remove & Restore	150 SF	23	690	206	0	0	0	224	1120
D43	.1615145.	PWR	6-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	80 LF	65	3217	401	1942	0	0	1390	6950
D43	.1631008.	PWR	1/c #500mcm Xple 28kv Shld Copper Cable	480 LF	29	1515	104	3515	0	0	1284	6418
D43	.1641008.	PWR	1/c #500 28kv Termination Including Hi-pot Testing	8 EA	62	3238	220	825	0	0	1071	5354
D43	.1651299.	PWR	Tie Breaker Substation 25 Kv 2-bkrs, Bus Pts, Pwr Cont Rm Batteries & Acfcessories	1 EA	176	9193	630	0	0	184450	48568	242841
D43	.1661100.	PWR	Substation Lighting	1800 SF	18	940	63	391	0	0	349	1743
D43	.1663100.	PWR	Substation Grounding	1800 SF	20	1045	71	488	0	0	401	2005
D43	.1677301.	PWR	Testing/checkout/adjust	16 MH	18	940	63	0	0	0	251	1254
D43	.1677311.	PWR	Training/manuals	4 HRS	0	0	0	217	400	0	54	671
D43	.1677321.	PWR	Spare Parts	5 $K	0	0	0	0	0	5425	1356	6781

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG		DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
	TOTAL	TIE- BREAKER SUBSTATION		496		2,266		400		56,519	
					23,838		10,095		189,875		282,993
D44		OVERHEAD CONTACT SYSTEM (OCS)									
D44	.1611001.OCS	Allowance For Pot-holing	3 EA	0	0	0	0	4500	0	0	4500
D44	.1611003.OCS	Allowance For Rerouting Of Utility Interferences	3 EA	0	0	0	0	22500	0	0	22500
D44	.1677051.OCS	Contact Wire 4/0 Awg Copper	29040 LF	671	40304	1725	53564	0	0	23898	119491
D44	.1677059.OCS	Return Wire 4/0 Awg Acsr	3000 LF	69	4144	178	2148	0	0	1618	8088
D44	.1677105.OCS	Pole W10x49x30'	88 EA	3252	195331	8309	114576	0	0	79554	397770
D44	.1677107.OCS	Pole W12x53x30'	88 EA	4066	244224	10387	143220	0	0	99458	497289
D44	.1677115.OCS	Pole Foundation 3'dia X 12'd	88 EA	2439	146499	6232	56333	0	0	52266	261330
D44	.1677117.OCS	Pole Foundation 3.5'diax14'd	88 EA	4066	244224	10387	90706	0	0	86329	431646
D44	.1677121.OCS	Down Guy Assembly	60 EA	370	22224	944	13020	0	0	9047	45235
D44	.1677123.OCS	Down Guy Foundn 3'dia X 8'd	60 EA	1109	66612	2833	26040	0	0	23871	119356
D44	.1677139.OCS	Head Span Assembly	88 EA	1626	97666	4155	171864	0	0	68421	342106
D44	.1677149.OCS	Catenary Pole Grounding	36 EA	42	2523	106	469	0	0	775	3873
D44	.1677151.OCS	25kv Disconnect Sw Assembly	8 EA	197	11833	504	0	0	21700	8509	42546
D44	.1677159.OCS	Cross -Connect Ground Wires & Running Rails-outside Tunnel	11 EA	493	29612	1259	13725	0	0	11149	55745
D44	.1677301.OCS	Testing/checkout/adjust	150 MH	231	13875	590	0	0	0	3616	18081
D44	.1677311.OCS	Training/manuals	16 HRS	0	0	0	868	1600	0	217	2685
D44	.1677323.OCS	Spare Parts	20 $K	0	0	0	21700	0	0	5425	27125
	TOTAL	OVERHEAD CONTACT SYSTEM (OCS)		18,631		47,609		28,600		474,153	
					1,119,071		708,233		21,700		2,399,366
	TOTAL	SEG 4: PULLMAN WAY MTN FAC SAN JOSE		19,127		49,875		29,000		530,672	
					1,142,909		718,328		211,575		2,682,359
D5		SEG 5: SAN JOSE TO GILROY									
D51		INCOMING POWER									
D51	.1613009.PWR	65'wood Pole 115kv W/crossarm Insulators, & Hardware	12 EA	264	13789	944	19530	0	0	8566	42829
D51	.1613025.PWR	115kv Dead-end Structure Incl Crossarms, Hardware & Insulators	2 EA	106	5536	378	7595	0	0	3377	16886
D51	.1613108.PWR	#4/0 Acsr Conductor	4000 LF	88	4596	317	2873	0	0	1947	9733
D51	.1677301.PWR	Testing/checkout/adjust	40 MH	44	2298	157	0	0	0	614	3069
	TOTAL	INCOMING POWER		502		1,796		0		14,504	
					26,219		29,998		0		72,517
D52		TRACTION POWER SUBSTATION									

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D52 .0200001.PWR	Sitework/drainage	12000 SF	60	2400	0	1042	0	0	861	4303
D52 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	640 LF	144	5038	564	5555	0	0	2789	13946
D52 .0342002.PWR	Concrete Foundations	72 CY	277	10334	2296	9374	0	0	5501	27505
D52 .1611022.PWR	Saw Cut Asphalt	240 LF	14	420	238	0	0	0	165	823
D52 .1611036.PWR	AC Paving Remove & Restore	360 SF	54	1620	495	0	0	0	529	2644
D52 .1615001.PWR	Precast Manhole 6'x 6'x4'D	6 EA	79	4126	283	14322	0	0	4683	23414
D52 .1615102.PWR	3-2" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	100 LF	29	1435	176	735	0	0	587	2933
D52 .1615149.PWR	12-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	200 LF	304	15044	1868	9198	0	0	6528	32638
D52 .1622400.PWR	Allow For Bus Supports, Equip Interconn's & Controls At Ea Substation	2 EA	66	3447	236	9765	0	0	3362	16810
D52 .1631008.PWR	1/c #500mcm Xple 28kv Shld Copper Cable	2560 LF	155	8096	555	18749	0	0	6850	34250
D52 .1641008.PWR	1/c #500 28kv Termination Including Hi-pot Testing	32 EA	246	12849	881	3298	0	0	4257	21285
D52 .1651052.PWR	115kv Surge Arrester	6 EA	53	2768	189	0	0	13020	3994	19971
D52 .1651201.PWR	115kv Circuit Switcher, 1200a	2 EA	106	5536	378	0	0	97650	25891	129455
D52 .1651284.PWR	20/26.6/35.4 MVA Transformer 115kv/25kv, Oil-filled (Scott Connected)	2 EA	1100	57453	3934	0	0	976500	259472	1297359
D52 .1651288.PWR	Ct/pt Cubicle For Utility Co Metering	2 EA	53	2768	189	0	0	18445	5351	26753
D52 .1651291.PWR	Traction Pwr Substation 25 Kv W/ Bkrs, Pts, Fused Disc Sws Cont Rm Pwr,batteries & Misc	2 EA	704	36770	2518	0	0	965650	251235	1256173
D52 .1651311.PWR	Power Factor Correction - Allowance Per Substation	2 EA	88	4596	315	0	0	32550	9365	46826
D52 .1651321.PWR	Harmonic Filters Allow - Allowance Per Substation	2 EA	132	6894	472	0	0	130200	34392	171958
D52 .1661100.PWR	Substation Lighting	12000 SF	119	6215	422	2604	0	0	2310	11551
D52 .1663100.PWR	Substation Grounding	12000 SF	132	6894	475	3255	0	0	2656	13280
D52 .1677301.PWR	Testing/checkout/adjust	120 MH	132	6894	472	0	0	0	1842	9208
D52 .1677311.PWR	Training/manuals	12 HRS	0	0	0	651	1200	0	163	2014
D52 .1677321.PWR	Spare Parts	20 $K	0	0	0	0	0	21700	5425	27125
TOTAL	TRACTION POWER SUBSTATION		4,047	201,597	16,956	78,548	1,200	2,255,715	638,208	3,192,224
D53	TIE- BREAKER SUBSTATION									
D53 .0200001.PWR	Sitework/drainage	1800 SF	9	360	0	156	0	0	129	645
D53 .0271128.PWR	Fence, 8' High, Chain Link Including Gate & Barbed Wire	173 LF	39	1364	152	1502	0	0	755	3773
D53 .0342002.PWR	Concrete Foundations	8 CY	31	1156	255	1042	0	0	613	3066

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D53 .1611022.PWR	Saw Cut Asphalt	100 LF	6	180	99	0	0	0	70	349
D53 .1611036.PWR	AC Paving Remove & Restore	150 SF	23	690	206	0	0	0	224	1120
D53 .1615149.PWR	12-4" Pvc Sch 40 Duct Bank Conc Encased Incl Earthwork	80 LF	121	5988	747	3679	0	0	2604	13018
D53 .1631008.PWR	1/c #500mcm Xple 28kv Shld Copper Cable	960 LF	58	3029	208	7031	0	0	2567	12835
D53 .1641008.PWR	1/c #500 28kv Termination Including Hi-pot Testing	16 EA	123	6424	441	1649	0	0	2129	10643
D53 .1651298.PWR	Tie Breaker Substation 25 Kv 5-bkrs, Bus Pts, Pwr Cont Rm Batteries & Accessories	1 EA	308	16087	1102	0	0	336350	88385	441924
D53 .1661100.PWR	Substation Lighting	1800 SF	18	940	63	391	0	0	349	1743
D53 .1663100.PWR	Substation Grounding	1800 SF	20	1045	71	488	0	0	401	2005
D53 .1677301.PWR	Testing/checkout/adjust	20 MH	22	1149	79	0	0	0	307	1535
D53 .1677311.PWR	Training/manuals	4 HRS	0	0	0	217	400	0	54	671
D53 .1677321.PWR	Spare Parts	6 $K	0	0	0	0	0	6510	1628	8138
TOTAL	TIE- BREAKER SUBSTATION		778	38,412	3,423	16,155	400	342,860	100,215	501,465
D54	OVERHEAD CONTACT SYSTEM (OCS)									
D54 .1611001.OCS	Allowance For Pot-holing	32 EA	0	0	0	0	48000	0	0	48000
D54 .1611003.OCS	Allowance For Rerouting Of Utility Interferences	32 EA	0	0	0	0	240000	0	0	240000
D54 .1677051.OCS	Contact Wire 4/0 Awg Copper	184700 LF	4267	256297	10971	340679	0	0	151987	759934
D54 .1677055.OCS	Messenger Wire 350mcm Copper	184700 LF	5689	341710	14628	601199	0	0	239384	1196921
D54 .1677059.OCS	Return Wire 4/0 Awg Acsr	184700 LF	4267	256297	10971	132264	0	0	99883	499415
D54 .1677101.OCS	Pole W8x31x30'	430 EA	10595	636389	27068	349913	0	0	253343	1266713
D54 .1677103.OCS	Pole W10x39x30'	191 EA	5589	335703	14278	196873	0	0	136714	683568
D54 .1677105.OCS	Pole W10x49x30'	191 EA	7059	423999	18035	248682	0	0	172679	863395
D54 .1677107.OCS	Pole W12x53x30'	142 EA	6560	394026	16760	231105	0	0	160473	802364
D54 .1677111.OCS	Pole Foundation 3'dia X 8'd	430 EA	7946	477277	20301	186620	0	0	171050	855248
D54 .1677113.OCS	Pole Foundation 3'dia X 10'd	191 EA	4412	265007	11272	101545	0	0	94456	472280
D54 .1677115.OCS	Pole Foundation 3'dia X 12'd	191 EA	5295	318044	13526	122269	0	0	113460	567299
D54 .1677117.OCS	Pole Foundation 3.5'diax14'd	142 EA	6560	394026	16760	146367	0	0	139288	696441
D54 .1677121.OCS	Down Guy Assembly	135 EA	832	49974	2125	29295	0	0	20349	101743
D54 .1677123.OCS	Down Guy Foundn 3'dia X 8'd	135 EA	2495	149862	6374	58590	0	0	53707	268533
D54 .1677125.OCS	Cantilever Arm Push-off Complete Assembly (medium)	652 EA	6024	361832	15391	424452	0	0	200419	1002094
D54 .1677127.OCS	Cantilever Arm Pull-off Complete Assembly (heavy)	350 EA	3234	194250	8262	341775	0	0	136072	680359
D54 .1677131.OCS	Counterweight Arrangement - Auto-tensioned Assembly	68 EA	2513	150943	6421	479570	0	0	159234	796168
D54 .1677135.OCS	Simple Catenary Termination Assembly, Auto-tensioned	68 EA	628	37721	1605	73780	0	0	28277	141383

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	OTHER	EQUIP-MENT	INDIRECT + OH&P	TOTAL DOLLARS
D54 .1677137.OCS	Mid-point Anchor Assembly Auto-tensioned	34 EA	419	25167	1070	44268	0	0	17626	88131
D54 .1677141.OCS	Catenary Hanger 4', Bronze, Including 2 - Connectors	954 EA	367	22044	938	20702	0	0	10921	54605
D54 .1677145.OCS	Potential Equalizing Jumper	840 EA	582	34958	1487	45570	0	0	20504	102519
D54 .1677147.OCS	Full Feed Jumper Set	34 EA	79	4745	201	4058	0	0	2251	11255
D54 .1677149.OCS	Catenary Pole Grounding	191 EA	221	13274	563	2487	0	0	4081	20405
D54 .1677151.OCS	25kv Disconnect Sw Assembly	1 EA	25	1502	63	0	0	2713	1070	5348
D54 .1677155.OCS	Section Insulator Assembly	2 EA	49	2943	126	6510	0	0	2395	11974
D54 .1677159.OCS	Cross -Connect Ground Wires & Running Rails-outside Tunnel	70 EA	3136	188364	8012	87343	0	0	70930	354649
D54 .1677301.OCS	Testing/checkout/adjust	250 MH	385	23125	984	0	0	0	6027	30136
D54 .1677311.OCS	Training/manuals	30 HRS	0	0	0	1628	3000	0	407	5035
D54 .1677323.OCS	Spare Parts	45 $K	0	0	0	48825	0	0	12206	61031
TOTAL	OVERHEAD CONTACT SYSTEM (OCS)		89,228	5,359,479	228,192	4,326,369	291,000	2,713	2,479,193	12,686,946
TOTAL	SEG 5: SAN JOSE TO GILROY		94,555	5,625,707	250,367	4,451,070	292,600	2,601,288	3,232,120	16,453,152
TOTAL	OPTION 2 : 25KV AC Segs 1 to Seg 5		425,615	25,292,878	1,156,238	20,697,305	2,012,250	7,631,349	13,694,476	70,484,496
REPORT TOTAL			425,615	25,292,878	1,156,238	20,697,305	2,012,250	7,631,349	13,694,476	70,484,496

ICF KAISER

INTER OFFICE MEMORANDUM

RECEIVED
MAY 3 0 1996
ESTIMATING SERVICES

TO Ben Cavin
AT Oakland

DATE May 30, 1996

FROM Dev Paul

Dev Paul

COPIES TO Dave Minister
Rey R. Belardo
File

AT Oakland

JOB NO. 65928

SUBJECT **Caltrain Electrification Project**
PG&E Power Supply costs for 25 kV Single Phase OCS Options & of 1500V DC OCS option

Per your request our interpretation of the attached PG&E letter dated May 21, 1996 is as follows:

A refundable advance fee of $ 900,000.00 for Traction Power Substation #1 near 22nd street in San Francisco is required in case of full 25 kV ac electrification option. PG&E expects to have underground power supply for this substation and requires above mentioned fee to cover some of their expenses. PG&E will not charge any other fee to deliver power to any of the other four traction power substations for this option based upon their assumptions indicated in the letter.

For the Dual Mode option of 4-miles tracks at 25 kV ac electrification with only one traction power substation near 22nd street assumption is made that PG&E will require the advance fee of $900,000.00 which will not be refundable.

For the Dual Mode option of 1500 DC electrification system assumption is made that PG&E power supply at 34.5 kV is available in the vicinity of the proposed two traction power substations. We should assume non refundable $ 500,000.00 PG&E power supply fees for the two substations under this option.

For dual mode options at 25 kV ac and 1500V DC it is assumed that the PG&E fees will be non-refundable as the power consumption revenue incentive to PG&E will not be as attractive as in the case of full 25 kV ac electrification system indicted in PG&E letter.

If you have any questions please let us know.

P:\65928\PG&E4

Pacific Gas and Electric Company

123 Mission Street
P.O. Box 770000
San Francisco, CA 94177
415/973-7000

RECEIVED
MAY 3 0 1996
ESTIMATING SERVICES

May 21, 1996

Dev Paul
ICF Kaiser Engineers, Inc.
18800 Harrison Street
Oakland, CA 94612-3430

We have provided rough estimates to interconnect the proposed five CalTrain substations associated with the electrification project. The EDRO for the first substation is 2005. All interconnections are at 115kv. These rough estimates were based on the following:

Unit cost guides without the benefit of field visits.

Assuming overhead line construction is feasible at all locations, except in San Francisco, where all transmission line is underground.

Overhead line right-of-way costs are the same as line construction costs.

Assuming that system reinforcements are in place by 2005 so that interconnecting CalTrain loads do not cause network line overloads, or that mitigating network overloads are PG&E costs.

CalTrain will install their own substations.

Current PG&E E20T tariffs, which are subject to change.

Station 1: Refundable advance of $ 900,000.
Station 2-5: PG&E expense for connection.

Sincerely,

Chester Livingston

Chester Livingston
Corporate Account Representative
Business Account Services

bcc: Alan Saunders
Stan Nishioka
Efrain Ornelas

CALTRAIN PROJECT SIGNAL SYSTEM ASSUMPTIONS

1. The cost estimates of the signal system modification are not for the purpose of up-grading the signal system, but only making it compatible with electrification.

2. There is no special effort made to reduce the rail to ground resistance as would normally be done for a new electrified system.

3. It is assumed that the existing block lengths will remain acceptable for the braking characteristics, speed and operation of the electrified railroad.

4. It is assumed that there will be room available in the bungalows and cases for the new track circuit equipment necessaary to adapt the existing sytem to 100 Hz. or cases.

5. It is assumed that work of modifiying equipment, installing cable, installing signal bridges, or installing cases can be performed by outside contractor in a timely manner. Only final cutover testing would be reserved exclusively for railroad maintenance forces.

6. It is assumed that the rail is continous except at special trackwork areas such as freight sidings or crossovers.

SEP 07 '95 08:54AM

BASIS OF ESTIMATE

1. That to the greatest degree practicable, the existing cases, logic, bungalows, and wayside signals would be used or re-used.

2. That areas that have line wire would have the same functions transfered to underground line wire (typically new 27C #14), and that areas that have no line wire due to electrocode system would have the electrocode modified to 100 Hz. to transmit the same functions. Per discussion with JPB personnel, this is oberved to be approximately 80 % of segment 3 and all of segment 5.

3. That the upgrade of track circuits between signal locations would be to 100 Hz. or PSO II type track circuits.

4. That highway grade crossing logic that uses audio frequency track circuits but no motion sensors or crossing predictors would not need to be disturbed. However, crossing cases that use predictors would need to be replaced with new cases (or racks for existing bungalow) with PSO track circuit and logic including battery and solid state gate crossing controller. In addition, there will be typically one additional new case per crossing to provide the PSO transmitter complete with power and battery. Per discussion with JPB personnel, it is noted that all grade crossing cases are either motion sensors or crossing predictor equipped.

5. San Francisco Terminal and San Francisco Yard will be controlled from San Jose control center. Code would be via separate fibers in fiber optic cable installed from San Jose to SF as part of communications upgrade to electrification.

6. That the traction power pole spacing from center of track can be adjusted to provide visibility for the existing signals up to 12 ft. 4 in. from center line of track. It is assumed that 25 % of the signal locations will need signal bridges for estimating purposes.

7. The rail will be made continous for traction power negative return using dual 350-MCM web and impedance bonds and dual 250 MCM C bonds at standard joints for special trackwork.

8. The estimate for segment 3 is based on verbal descriptions of the trackwork and existing signal equipment with JPB technical personnel. The estimate for segment 5 is based on SP track signal charts plus verbal information.

9. The signal system modifications for segment 4 (Pullman Way Yard) is assumed to be zero cost because it has not been purchased yet it could be designed and installed compatible with electrification.

SEP 07 '95 08:54AM

COMMENTS

Although the estimate is based on a rehabilitation of the existing signal system without upgrading the existing 40 year old equipment or upgrading the capabilities of the system to Central Traffic Control. The operation of a passenger railroad that has dual freight use needs control and indication in order to maintain schedules in emergency and maintenance situations. Therefore, if the signal system is to be modified for electrification, the JPB should consider additional upgrades beyond those identified in the estimate.

SEP 07 '95 08:55AM

REV BCC 9/15/94

ESTIMATE

The signal estimate is divided into 2 parts. Part 1 is the new track work. This includes segment 1 (the new terminal and Hooper street crossover) and segment 2 (the 16 th street yard). Part 2 is to modify the existing signal system from San Francisco to Gilroy. Part 2 includes the segment 3 (16 th steet to Pullman yard), segment 4 (Pullman yard), and segment 5 (Pullman Way Yard to Gilroy). The costs shown for the estimate include materials, installation, test and final design.

SW 10

PART 1 - SAN FRANCISCO EXTENSION

Seg. 1a Alternative 2A, a two level terminal including racks for train control room in station structure, 6 special mounted signals, 10 switch machines, 14 track circuits, cable, interlocking logic, backup local control panel and CTC equipment. - $ 900,000.

Seg. 1b Hooper Street Crossover including bungalow (plus miscellaneous equipment), two signal bridges, 4 signals, 4 switch machines, 6 track circuits, cable, interlocking logic and CTC equipment. - $650,000.

Seg. 1c. Line cable (27 conductor 14 Awg.) between bungalows (12,000 ft.) - $96,000.

Segment 1 Total - $1,646,000

Seg. 2 San Francisco Yard including bungalow, 6 signal bridges, 14 signals, 10 switch machines, 22 track circuits, cable, interlocking logic and CTC equipment. - $1,600,000

San Jose CTC equipment, software, installation and test for segments 1 and 2 above. - $130,000

PART 1 TOTAL - $3,376,000

SW 1

PART 2 - MODIFICATION OF EXISTING LINE

The modification of the existing signal system would need to be done at night or in a manner to permit operations to continue. This increases unit costs compared to new track.

Segment 3 - San Francisco to Pullman Way Yard - $13,963,200

Segment 4 - Pullman Way Yard - ~~$ 0~~ 570 000

Segment 5 - Pullman Way Yard to Gilroy - $5,545,700

PART 2 TOTAL ~~$ 19,508,900~~ 20,078,900

USE 20,100,000

SEP 07 '95 08:54AM

copied

Post-it™ Fax Note 7671	Date 9/15	# of pages ▶ 2
To Dev Paul / Kanwaljit	From R. Boerwinkle	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

To: Dev Paul/Kanwaljit Kalsi

From: Robert Boerwinkle

Date: September 15, 1995

No information was provided about the configuration or type of signal equipment that will be used in the Pullman Way Yard. Therefore, per instructions from Oakland, a hypothetical yard has been assumed as the basis for estimate. It has 12 storage tracks, two maintenance shop tracks, and a double track lead to the mainline. I have assumed that it will be built using DC track circuits with a tower or remote control and that dwarf signal will be used which will still be compatible with the electrification. Cost to convert such a yard signal system to electrification compatible would be approx. $570,000.

A question has been raised about the need for signal bridges since the traction power poles are intended to be on the side instead of the center of two tracks. This was known. However, signal is always on the right side of the tracks. Poles on the side would always potentially block visibility for one tracks signals. On single track double direction territory the pole would always potentially block visibility for the signal for one direction.

Cal Train Existing Track Signal Modification

	Name & Description	Unit Price	SEG 3 # Units	SEG 3 Ext. Price	SEG 5 # Units	SEG 5 Ext. Price
1	Negative return 250 MCM bonding	$150	944	$141,600	534	$80,100
2	Negative return 350 MCM bonding	$200	528	$105,600	528	$105,600
3	Single track signal bridge	$35,000	10	$350,000	3	$105,000
4	Double track signal bridge	$50,000	20	$1,000,000	7	$350,000
5	Track circuit modification including impedance bond and installation	$35,000	118	$4,130,000	47	$1,645,000
6	Highway grade crossing predictor case replacement for double track	$80,000	56	$4,480,000	11	$880,000
7	Highway grade crossing PSO II transmitter case for double track	$35,000	56	$1,960,000	11	$385,000
8	Highway grade crossing predictor case replacement for single track	$50,000	0	$0	21	$1,050,000
9	Highway grade crossing PSO II transmitter case for single track	$30,000	0	$0	25	$750,000
10	Aerial line wire replacement with buried 27 C -14 Awg. Cost per thousand foot installed	$8,000	207	$1,656,000	0	$0
11	Power wire buried 2 C - 4 Awg. Cost per thousand foot installed	$5,000	28	$140,000	39	$195,000
	TOTALS			$13,963,200		$5,545,700

SEP 07 '95 08:55AM

REV 9/28/95
13 cc

CALTRAINS

COMMUNICATIONS

COST SUMMARY

SUBSYSTEM	DATE OF COST BASIS	COST IN '000's
PA	6-22-94	351.2
CCTV	1-26-94	156.8
F&EM	10-27-93	259.2
RADIO	3-23-94	1821.8
TELEPHONE	9-1-95	27.5
SEISMIC	5-25-94	24.7
VMS	7-28-93	201.5
INSTALLATION	5-25-95	664.1
SCADA	9-1-95	196.0
MUX EQP.	12-15-93	165.9
FIBER OPTIC		2893.2 AMENDMENT
SPARES		177.2
TOTAL		$6,939.1

CRF
9-5-95

Cost Allocation

SW1 COMMUNICATION ASSOCIATED W/ OPERATION OF TRACTION POWER SYSTEM $300

SW10 COMMUNICATIONS REQUIRED FOR ALL ALTERNATIVES 6,639

6,939

AMENDMENT
TO
COST ESTIMATE FOR CALTRAINS SUBMITTED ON 9-5-95

Spares are estimated as follows:

Total hardware costs, except Radio = 1,382.0 K	
5% of 1,382 K =	69.1 K
Non Radiax portion of Radio = 621.2 K	
10% of 621.2 K =	62.1 K
500' of radiax @ $87/Ft =	43.5 K
1000' of Fiber cable @ $2.50/Ft =	2.5 K
TOTAL SPARES =	177.2 k

Fiber optic cable, installed is estimated as follows:

Normal installed cost would be $6.25/Ft.
Because of the multiple tap offs required by ATC and to cover fiber termination panels, etc. the installed cost was estimated at $7.00/Ft.

413,317' of fiber cable @ $7.00/Ft =	2,893.2 K

TOTAL 3070.4

CRF
9-14-95

STATION COMMUNICATIONS

ASSUMPTIONS

EACH OF 2 LEVELS OF PLATFORM ARE 1000 × 67.5 FT = TOTAL 135K FT²

MEZZINE LEVEL IS 1000 × 76 FT 76 K FT²

PUBLIC AREA TOTAL 211 K FT²

PUBLIC AREA

TYPICAL REG LINE STA. (LITTLE TOKEYO) = 68 × 570 × 2 = 77.5 K FT²

" " " ANCILLARY AREA = 120 × 80 × 2 = 19.2 K FT²

RATIO OF PUBLIC AREAS 211/77.5 = 2.72

RATIO OF TOTAL AREAS = (211 + 19.2) / (77.5 + 19.2) = 2.38

NOTES -

ANCILLARY AREA INCLUDES TPS. IF ELECTRIFIED A SIGNIFICANT AMOUNT OF 25KV SWITCH GEAR WILL BE REQUIRED TO SECTIONALIZE THE 4 PLATFORM TRACKS AND VARIOUS ARRANGEMENTS FOR THE 2 DOUBLE X-OVERS + THE TWO TURN OUTS LEADING TO THE DOUBLE X-OVERS.

NO SPARES INCLUDED

NO TICKET VENDING EQ^{P} INCLUDED

STATION COMMUNICATIONS

P A

ASSUMPTIONS:

P A USED AS FIRE ALARM SYSTEM

∴ WILL NEED IN BOTH PUBLIC & ANCILLARY AREAS

THUS, PA COSTS RATIOED BY 2.38

PRICES (EQP ONLY) BASED ON SESCO AWARD 6-22-94 FOR MULTI YEAR PROCUREMENT ON RED LINE

1 EA	EQP CABINET E/W AMPS, ZONE SELECT, ALARMS, EQUALIZERS ET.	49.8K
2 EA	EMERGENCY MGT. PANEL EQP (PRI+SEC ENTRANCE)	4.4K
		54.2
	54.2 x 2.38 =	129.0K
		79.6K
		208.6K

NON RECURRING:

MANUALS	9.2
SOFTWARE	9.8
TEST PLANS + PROCEDURES	9.8
INSTALLATION PLANS	9.8
TECH. SUPPORT	6.4
DSGN	18.0
	63.0K

~~1500 SPKRS~~ 300/STA.

NEED TO ADD SPKRS. ~~1500 SPKRS / 5 STA~~

300/ STA. RED LINE x 2.38 = 714 SPKRS

ATLAS SOUNDOLIER APC-30 @ 111.50 /EA x 714 = 79.6K

STATION COMMUNICATIONS

CCTV

CCTV COVERAGE ON RED LINE IS BASICALLY PLATFORM (CENTER PORTION MAINLY), FARE VENDING MACHINES, AND ESCALATORS. I.E. PUBLIC AREAS ONLY, THUS RATIO OF 2.72 WILL BE USED. COSTS BASED ON ETB TECH. BID OF 1-26-94 (MULTI YEAR PROCUREMENT)

CAMERAS	33.5 M	x 2.72	= 91.3 M
COMMON EQP	13M	x 1	= 13.0 M
			104.3 M
MONITORS	5.9 M	x 2.72	= 16.1 M
			120.4 M

NON RECURRING

MANUALS	9.0
TRAINING	14.3
TEST EQP.	9.6
TECH SUPPORT	3.5
	36.4 M

STATION COMMUNICATIONS
FIRE & EMERG. MGT.

ASSUMPTIONS: WILL NEED IN BOTH PUBLIC & ANCILLARY AREAS
THUS, 2.38 RATIO USED
THERE WILL BE BOTH A PRIMARY AND SECONDARY RESPONSE POINT FOR EMERGENCY SERVICES. COSTS BASED ON AXYAL CORP BID OF 10-27-93

SMOKE/FIRE DET. + LARO ROR.	10.54	× 2.38	= 25.1 K
INTRUSION DET. PUBLIC AREA	.95	× 2.38	= 2.3 K
" " ANCILLARY	7.40	× 1	= 7.5 K
EMERG. EXIT INTRUSION DET.	7.16	× ~~2.38~~ 2.72	= 19.5 K
BLU LITE STA.	1.449	× (8 END PLAT + 4 X-OVER) 20 × PASSAGE)	= 46.4 K
EMP			18.3
CP			1.3
		EQP. RM.	50.7
			171.1 K

NON RECURRING -

MANUALS	5.3
SYS. ASSURANCE	20.9
ENG.	24.5
S/W ENG & PROG.	10.5
ACCPT TEST	17.9
TECH SUPPORT	9.0
	88.1 K

NOTE - EMC THINKS CONTRACTOR SIGNIFICANTLY UNDER BID ± 30% ON THIS CONTRACT.

STATION / TUNNEL COMMUNICATIONS
RADIO

ASSUMPTIONS - PER TOM HERROLD (SP?) OF BART, GREATER S.F. PUBLIC SERVICE AREA WILL HAVE A TRUNKED 800 MHz RADIO SYSTEM FOR ALL LOCAL GOVT SERVICES. HE SUGGESTS ~~ONE~~ TWO EA 800 MHz CHANNELS IN TUNNEL/STATION, ONE FOR ~~FIRE~~ FIRE SERVICES AND ONE FOR LOCAL POLICE.

ADDITIONALLY, ASSUME 3 EA 160 MHz CHANNELS FOR RR USE, I.E. 1-TRAIN OPERATIONS, 1-RR POLICE, 1-MAINTENANCE.

CANNOT FEED 1.5 MILES OF TUNNEL @ 800 MHz WITH BASE STATIONS AT EACH END. THEREFORE, ASSUME 2 RADIAX CABLES IN EACH TUNNEL (ONE T_x - ONE R_x PER TUNNEL) WILL NEED LINEAR AMPS @ 800 MHz AT 1/4 TUNNEL LENGTH TO BOOST BASE STATIONS.

PRICES BASED ON AMELCO BID OF 3-23-94

VHF BASE STATIONS	2 EA @ 6.7K	= 13.4 K
800 MHz BASE STATIONS	2 EA @ 6.7K	= 13.4 K
800 MHz RPTR/AMPS	4 EA @ 138.5K	= 554.0 K
SPLITTERS, COMBINERS ETC		= 40.4 K
STATION CABLING	2.3 K 2.3B	= 5.6 K
TUNNEL CABLING @ $87/FT (4 CABLES) K 10115'		= 880.0 K
		1,506.8 K
INSTALLATION		110 K
MANUALS		10 K
TRAINING		20 K
ENG.		165 K
TECH. SUPPORT		10 K
		315 K

STATION COMMUNICATIONS

TELEPHONE & SEISMIC & INSTALLATION P&T CCTV FEM

EACH ETS NEEDS PHONE = 34

2 PASSGR ASST / PLATFORM = 4

ELEVATORS = 3

FARE VENDING = 4

ANCILLARY ROOMS = 20

EMERG. EXITS = 4

CONTROL CTR. = 4

43

$500/LINE USUAL INSTALLED COST OF PBX (NO RED LINE EQUIVALENT)

ASSUME 50 LINE @ .5K/LINE = 25K

ADD 10% FOR SPARE CAPACITY + SPECIAL TRUNKS = 2.5K

27.5K

SEISMIC

BASED ON L.K. COMSTOCK BID 5-25-94

SEISMIC EQP/STA	20.3K	INSTALL 13.4
TRAINING	4.4K	
	24.7	38.1 K

ALSO COMSTOCK BID 5-25-95

PA	19.63 x 2.38 =	46.7K
CCTV	29.58 x 2.72 =	80.5K
SEISMIC	13.4 x 1 =	13.9 K
F+EM	153.4 x 2.38 =	365.3 K.
VMS	11.25 x 2.72 =	30.6 K
MOF + X-CONNECTS	38.56 x 2.38 =	91.8 K
MISC. DUCT LINER, SEISMIC BRACE INTERPOSING RELAYS, ETC.	15.02 x 2.38 =	35.8K
		664.1 K

STATION COMMUNICATIONS

VMS

ASSUMPTIONS -

VMS WILL MEET AOA REQUIREMENTS.
THEREFORE SIGNS WILL BE NEEDED IN ALL PUBLIC AREAS, INCLUDING STATION ENTRANCES.
VMS NOT REQUIRED IN ANCILLARY AREAS
THEREFORE RATIO OF 2.72 US REQ LINE IS USED
COSTS BASED ON SESCO BID OF 7-28-93

STATION CONTROL UNITS (1 EA)		4.4 M
STROBES 1.54K x 2.72	=	4.2 M
DISPLAY UNITS 11.89 x 2.72	=	32.3 M
WEATHER PROOF DISPLAYS 4.41 x 2.72	=	12.0 M
DISPLAY UNITS EDGE LIT 18.6 x 2.72	=	50.6 M
		103.5 M

NON RECURRING

TEST EQP	4.9 M
ENG./MOB/MGT/TECH SUPPORT	93.1
	98.0 M

SCADA & F.O. WITH MUX EQP.

ASSUME 4 TPS's + 3 SECTIONALIZATION LOCATIONS + TERMINAL

PER FRED MARTINO OF MACRO CORP. THE MASTER STA. FOR SUCH A SMALL SYSTEM WOULD BE 80 K

CONSULTING & COORDINATION OF DESIGN 20 K

REMOTE TERMINAL UNITS @ 12K EA x 8 96 K

196 K

IN 4-5 YEAR PLC's SHOULD BE CONFIGURABLE TO ACT AS RTU, THUS, POSSIBLY 96K COULD BE CUT FROM ESTIMATE.

FIBER OPTIC -

HEN SHOULD PRICE OUT A CABLE PULLED INTO EXISTING DUCT FOR THE LENGTH OF THE SYSTEM. AS A MINIMUM 8 FIBERS ARE NEEDED (4 COMM, 4 ATC) SUGGEST 12 FIBERS TO ALLOW FOR SPARES.

MUX EQP. NEED 9 EA, ONE AT EACH BREAKER LOCATION + ONE AT CENTRAL CONTROL

PRICES BASED ON ETA TECH BID OF 12-15-93

CHANNEL BANKS 2.58 x 9 x 2 NEED REDUNDANCY	46.4
4 WIRE EOM CARDS 6 x 9 x 2 x .258	27.9
POWER SUPPLIES 2.31 x 9 x 2	41.6
	115.9 K

TECH SUPPORT	10 K
ENG.	20 K
DOCUMENTATION	20 K
	50 K

CALTRAINS COMMUNICATIONS

The following communications related system were considered/estimated for the proposed new CalTrains station in San Francisco:

1) Public Address (PA)

2) Closed Circuit Television (CCTV)

3) Fire and Emergency Management (F&EM)

4) Radio

5) Telephone

6) Variable Message Signs (VMS)

7) Supervisory, Control and Data Acquisition (SCADA)

The PA system is used for emergency evacuation announcements as well as a supplemental communications system for the emergency services, once the station has been evacuated. To qualify as such a system all of the elements of the PA system need to be supervised and an alarm given when a failure is detected. Such systems are listed by the Underwriters Labs and are further listed by the State of California Fire Marshall. As well as having provisions for routine announcements from a central location (Station Control Room), provisions for emergency announcements from microphones located at entrance(s) to the station were fire and emergency responses will use. Additionally pre-recorded emergency evacuation announcements will be needed. These are triggered by either station supervisory personnel or if a fire detector alarm remains unacknowledged for a predetermined time, the evacuation announcement is automatically initiated.

To enable PA announcements to be understandable, architectual control of reverberation time is required.

CCTV is primarily a security aid. Coverage of ticket vending and change making machines, station entrances, escalator wells and platforms are the usual areas covered. Views of ticket vending and change making machines are for revenue security. Views of escalator wells are to allow remote stopping of escalators for emergency evacuation. Views of station entrances are for general security and verification of emergency evacuation. Views of the station platforms allow crowd control and aid operations in verifying when trains have actually arrived and stopped or have started a departure. Fixed view cameras were assumed for this exercise, however, as the design becomes closer to being firmed up consideration of pan, tilt and zoom cameras

may be considered since there will probably be only one monitoring location.

The Fire and Emergency Management System will also be required to be Underwriters and California Fire Marshall listed. Various smoke, combustion products, temperature and rate of rise of temperature detectors will be required as well as monitoring sprinkler systems. A "Fire Alarm Control Panel" which centralizes all alarms from detectors and sprinkler systems will be required. Supplemental alarm panels may be required at entrances designated by the fire services.

In addition to fire detection, the F&EM system will contain intrusion detector capability to monitor doors to ancillary rooms, emergency exit doors and gates and some form of entry authorization (card key) for various non public areas in the station. The F&EM system contains the arrangement to incorporate "Blue Light" stations. These blue light stations allow emergency removal of power from the overhead power feed to the trainway. The fire services require these stations at each point were they may gain access to the trainway and they are also generally located at ends of platforms (just off of the platform) and at each end of special trackwork. The fire services may use rescue or special trains to take them to the location of a fire in the tunnel. Blue light stations are therefore required at each access point between tunnels.

The tunnel will require radio coverage for train operations channels and other railroad functions. It is assumed that there will be a RR police/security channel and a maintenance channel required. Additionally it is understood that within the near future all local public service radio will be converted to a trunked 800 MHz system. The BART communications people are planning on needing to furnish to 800 MHz channels for the fire and local police. The same coverage should be furnished in the CalTrains tunnel. Additionally, the emergency services will require 800 MHz coverage in all areas of the station. Because of the length of the tunnel, 800 MHz coverage is difficult, since the losses of the distributed coxial cable antenna are considerable at these frequencies. Therefore a dual antenna system in each tunnel is recommended. One antenna is used for transmitting to the mobiles and portables in the tunnel(s) and the other antenna is used to receive signal from the mobiles and portables. With this arrangement, one way amplifiers can be used in each cable to make up for the losses at 800 MHz. The station proper will derive coverage by the use of a combination of leaky coxial antennas running through various ancillary rooms and areas and space antennas to give coverage in the large volume areas such as the mezzanine and the platforms.

Three types of telephone service will need to be furnished by an electronic automatic (dial) telephone switchboard. Regular administrative dial telephone will be furnished in each of the areas where working personnel are normally stationed. Additionally, it is good practice to have a telephone just inside the door of all ancillary rooms. This phone can be used to initiat a fire alarm as well as for normal administrative and maintenance functions. Additional maintencance telephones are located next to equipment needing regular maintenance. Emergency telephones which connect directly to the control room without dialing when the handset is picked up are used at various strategic locations. Each of the blue light stations is equipped with an emergency telephone. Each emergency exit should have an emergency telephone just inside the door to the outside. Each elevator requires an emergency phone.

Additional direct connection phones are needed as passenger assistance phones. These are usually located near the fare vending machines and at the platform level.

Recent ADA legislation has required the use of Variable Message Signs to augment the PA system. These signs are required to closely repeat in text the spoken emergency messages on the PA system. The emergency evacuation messages need to be automatically initiated when the PA messages are automatically initiated. The VMS signs are usually also used for routine announcements, such as, train arrivals and departures. They can also be used to make general announcements, such as, time and date, pending fare or schedule changes, etc.

With modern control of station and tunnel ventilation by the use of PLC controllers there is no need for a SCADA system to initiate control of the various station functions from the control room. The various functions can be directly remoted to the control room via hard wired data links. There is a need to interface the blue light stations to the SCADA system that controls the traction power to the tunnels and platforms.

--WORK BREAKDOWN--- FACIL	STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
610		16TH ST. YARD - 1A & 1 B									
610	.0000003.	8 TRACKS + 1 OUTSIDE SIDING FUEL FACILITIES INCLUDED EXISTING BLDG DEMOLISHED	1 LS	0	0	0	0	0	0	0	0
610	.0212210.	CLEAR & GRUB	53710 SY	1611	57781	15737	0	0	0	29407	102925
610	.0220240.	HAUL TO DUMP DEBRIS	8950 CY	0	0	0	0	89500	0	4475	93975
610	.0225001.	PREPARE SUBGRADE	53710 SY	591	25380	13642	0	0	0	15609	54631
610	.0225251.	PAVEMENT MARKING	1 LS	0	0	0	0	5000	0	250	5250
610	.0268001.	SITE DRAINAGE	1 LS	0	0	0	0	500000	0	25000	525000
610	.0271128.	FENCE, 8' HIGH, CHAIN LINK W/ BARBED WIRE	2520 LF	517	18383	2197	19139	0	0	10146	49865
610	.0271148.	FENCE GATE, VEHICLE 8' CHAIN LINK	60 LF	32	1138	135	2474	0	0	757	4504
610	.0282003.	3" A.C. PAVING OVER 6" AGG. BASE (INCL SUBBASE AND FINISH COURSE)	16645 SY	1997	76445	22221	173573	0	0	56824	329063
610	.0310100.	FORMS - GENERAL	11070 SF	2325	104222	2225	10690	0	0	29284	146421
610	.0332300.	REBAR - GENERAL	110250 LB	992	41916	7166	31102	0	0	20046	100230
610	.0334304.	CONCRETE - SERVICE PLATFORMS	1225 CY	613	22942	3778	90381	0	0	29275	146376
610	.1194002.	DIESEL FUELING FACILITY COMPLETE	1 LS	0	0	0	0	500000	0	25000	525000
610	.1194003.	CLEANING & OTHER EQUIPMENT COMPLETE	1 LS	0	0	0	0	250000	0	12500	262500
610	.1310001.	MISC SERVICE BLDGS	4200 SF	2394	0	0	0	252000	0	12600	264600
610	.1310003.	GUARD HOUSE	1 EA	0	0	0	0	15000	0	750	15750
610	.1573251.	FIRE PROTECTION	448000 SF	2688	0	0	0	448000	0	22400	470400
610	.1573259.	INCOMING UTILITY CONNECTIONS	1 LS	0	0	0	0	500000	0	25000	525000
610	.1610010.	YARD LIGHTING	312000 SF	0	0	0	0	109200	0	5460	114660
610A		MAINTENANCE OF WAY EQUIPMENT									
610A	.1194004.	MAINTENANCE OF WAY EQUIPMENT	1 LS	0	0	0	0	0	1085000	54250	1139250
	TOTAL	MAINTENANCE OF WAY EQUIPMENT		0	0	0	0	0	1,085,000	54,250	1,139,250
	TOTAL	16TH ST. YARD - 1A & 1 B		13,760	348,207	67,101	327,359	2,668,700	1,085,000	379,033	4,875,400
REPORT TOTAL				13,760	348,207	67,101	327,359	2,668,700	1,085,000	379,033	4,875,400

REPORT D1 - ESTIMATE DETAIL BY FACILITY

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
611	16TH ST. YARD - 1C									
611 .0000003.	8 TRACKS + 1 OUTSIDE SIDING FUEL FACILITIES INCLUDED EXISTING BLDG DEMOLISHED	1 LS	0	0	0	0	0	0	0	0
611 .0212210.	CLEAR & GRUB	53710 SY	1611	57781	15737	0	0	0	29407	102925
611 .0220240.	HAUL TO DUMP DEBRIS	8950 CY	0	0	0	0	89500	0	4475	93975
611 .0225001.	PREPARE SUBGRADE	53710 SY	591	25380	13642	0	0	0	15609	54631
611 .0225251.	PAVEMENT MARKING	1 LS	0	0	0	0	5000	0	250	5250
611 .0268001.	SITE DRAINAGE	1 LS	0	0	0	0	500000	0	25000	525000
611 .0271128.	FENCE, 8' HIGH, CHAIN LINK W/ BARBED WIRE	2520 LF	517	18383	2197	19139	0	0	10146	49865
611 .0271148.	FENCE GATE, VEHICLE 8' CHAIN LINK	60 LF	32	1138	135	2474	0	0	757	4504
611 .0282003.	3" A.C. PAVING OVER 6" AGG. BASE (INCL SUBBASE AND FINISH COURSE)	16645 SY	1997	76445	22221	173573	0	0	56824	329063
611 .0292315.	RETAINED CUT - ONE SIDE	260 RF	4248	176759	30508	216602	315832	0	120359	860060
611 .0310100.	FORMS - GENERAL	11070 SF	2325	104222	2225	10690	0	0	29284	146421
611 .0332300.	REBAR - GENERAL	110250 LB	992	41916	7166	31102	0	0	20046	100230
611 .0334304.	CONCRETE - SERVICE PLATFORMS	1225 CY	613	22942	3778	90381	0	0	29275	146376
611 .1194002.	DIESEL FUELING FACILITY COMPLETE	1 LS	0	0	0	0	500000	0	25000	525000
611 .1194003.	CLEANING & OTHER EQUIPMENT COMPLETE	1 LS	0	0	0	0	250000	0	12500	262500
611 .1310001.	MISC SERVICE BLDGS	4200 SF	2394	0	0	0	252000	0	12600	264600
611 .1310003.	GUARD HOUSE	1 EA	0	0	0	0	15000	0	750	15750
611 .1573251.	FIRE PROTECTION	448000 SF	2688	0	0	0	448000	0	22400	470400
611 .1573259.	INCOMING UTILITY CONNECTIONS	1 LS	0	0	0	0	500000	0	25000	525000
611 .1610010.	YARD LIGHTING	312000 SF	0	0	0	0	109200	0	5460	114660
611A	MAINTENANCE OF WAY EQUIPMENT									
611A .1194004.	MAINTENANCE OF WAY EQUIPMENT	1 LS	0	0	0	0	0	1085000	54250	1139250
TOTAL	MAINTENANCE OF WAY EQUIPMENT		0	0	0	0	0	1,085,000	54,250	1,139,250
TOTAL	16TH ST. YARD - 1C		18,008	524,966	97,609	543,961	2,984,532	1,085,000	499,392	5,735,460
REPORT TOTAL			18,008	524,966	97,609	543,961	2,984,532	1,085,000	499,392	5,735,460

REPORT D1 - ESTIMATE DETAIL BY FACILITY

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
264	RETAINED CUT - ONE SIDE									
264 .0000021.	1C - 100' AVERAGE SECTION 16TH ST YARD SIDING	1 EA	0	0	0	0	0	0	0	0
264 .0214632.	REMOVE CONCRETE GUIDE WALLS	200 LF	0	0	0	0	18182	0	909	19091
264 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	90 CY	0	0	0	0	5728	0	286	6014
264 .0220227.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) < 75'	1850 SF	0	0	0	0	33300	0	1665	34965
264 .0220240.	HAUL TO DUMP DEBRIS	450 CY	0	0	0	0	4500	0	225	4725
264 .0220242.	DUMP FEE	450 CY	0	0	0	0	5400	0	270	5670
264 .0220332.	COMPACTED FILL	430 CY	130	4599	703	4997	0	0	2621	12920
264 .0221109.	DEWATERING	100 RF	0	0	0	0	36364	0	1818	38182
264 .0221120.	EXCAV MASS-2CY CLAMSHELL	880 CY	114	5238	2097	0	0	0	2934	10269
264 .0267250.	INSTRUMENTATION	100 RF	0	0	0	0	8000	0	400	8400
264 .0310100.	FORMS - GENERAL	695 SF	146	6545	140	671	0	0	1839	9195
264 .0313206.	NEOPRENE WATERSTOPS,DB, 6"	100 LF	9	403	9	563	0	0	244	1219
264 .0332300.	REBAR - GENERAL	92000 LB	828	34986	5980	25953	0	0	16730	83649
264 .0334300.	CONCRETE - SLAB ON GRADE	324 CY	162	6063	999	22499	0	0	7390	36951
264 .0354400.	CONCRETE - EXTERIOR WALLS	37 CY	65	2433	399	2569	0	0	1350	6751
264 .0511131.	STRUCTURAL STEEL - STRUTS 2' DIAM. X 1" STEEL PIPE, WHALERS W36 X 300 & MISC	45 TON	180	7716	1407	19530	0	0	7163	35816
264 .1573201.	WET STANDPIPE	100 TF	0	0	0	0	10000	0	500	10500
TOTAL	RETAINED CUT - ONE SIDE		1,634	67,983	11,734	76,782	121,474	0	46,344	324,317
REPORT TOTAL			1,634	67,983	11,734	76,782	121,474	0	46,344	324,317

REPORT D1 - ESTIMATE DETAIL BY FACILITY

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY		MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
630			ALTERNATE YARD @ TOWNSEND										
630		.0000005.	8 TRACKS + OUTSIDE SIDING	1	LS	0	0	0	0	0	0	0	0
630		.0212210.	CLEAR & GRUB	48900	SY	1467	52616	14328	0	0	0	26778	93722
630		.0220240.	HAUL TO DUMP DEBRIS	8150	CY	0	0	0	0	81500	0	4075	85575
630		.0225001.	PREPARE SUBGRADE	48900	SY	538	23104	12421	0	0	0	14210	49735
630		.0225251.	PAVEMENT MARKING	1	LS	0	0	0	0	5000	0	250	5250
630		.0268001.	SITE DRAINAGE	1	LS	0	0	0	0	500000	0	25000	525000
630		.0271128.	FENCE, 8' HIGH, CHAIN LINK W/ BARBED WIRE	1665	LF	341	12125	1452	12646	0	0	6695	32918
630		.0271148.	FENCE GATE, VEHICLE 8' CHAIN LINK	60	LF	32	1138	135	2474	0	0	757	4504
630		.0282003.	3" A.C. PAVING OVER 6" AGG. BASE (INCL SUBBASE AND FINISH COURSE)	7350	SY	882	33763	9812	76645	0	0	25095	145315
630		.0310100.	FORMS - GENERAL	27740	SF	5825	261115	5576	26787	0	0	73370	366848
630		.0332300.	REBAR - GENERAL	172800	LB	1555	65705	11232	48747	0	0	31421	157105
630		.0334304.	CONCRETE - SERVICE PLATFORMS	1920	CY	960	35928	5921	141658	0	0	45877	229384
630		.1194002.	DIESEL FUELING FACILITY COMPLETE	1	LS	0	0	0	0	500000	0	25000	525000
630		.1194003.	CLEANING & OTHER EQUIPMENT COMPLETE	1	LS	0	0	0	0	250000	0	12500	262500
630		.1310004.	OPERATOR'S OFFICE, CHANGE ROOM & TOILETS 80' X 40'	3200	SF	1824	0	0	0	192000	0	9600	201600
630		.1573251.	FIRE PROTECTION	440100	SF	2641	0	0	0	440100	0	22005	462105
630		.1573259.	INCOMING UTILITY CONNECTIONS	1	LS	0	0	0	0	500000	0	25000	525000
630		.1610010.	YARD LIGHTING	288150	SF	0	0	0	0	100853	0	5043	105896
630A			MAINTENANCE OF WAY EQUIPMENT										
630A		.1194004.	MAINTENANCE OF WAY EQUIPMENT	1	LS	0	0	0	0	0	1085000	54250	1139250
	TOTAL		MAINTENANCE OF WAY EQUIPMENT			0	0	0	0	0	1,085,000	54,250	1,139,250
	TOTAL		ALTERNATE YARD @ TOWNSEND			16,065	485,494	60,877	308,957	2,569,453	1,085,000	406,926	4,916,707
REPORT TOTAL						16,065	485,494	60,877	308,957	2,569,453	1,085,000	406,926	4,916,707

5/21/96

YARD EQUIPMENT

– PER LOU SALABER 5/21/96 –

1194002 DIESEL FUELING FACILITY COMPLETE $50,000

1194003 CLEANING & OTHER EQUIP COMPLETE $250,000

PHONE MESSAGE FROM DAVE MINISTER RECD 5/28/96

BASELINE SCHEMES

FOR:

TRACKWAY EXTENSION
NEW TERMINAL

ELECTRIFICATION FROM SATELITE YARD
(16TH ST) TO NEW TERMINAL

TOTAL MOW EQUIP $1,000,000

ALTERNATIVE

25KV AC TO GILROY

ADDITIONAL MOW EQUIP $500,000
(FROM SCREENING ESTIMATE)

CALCULATIONS KE Form No. E-6 Rev. 12-89

CALTRAIN SAN FRANCISCO
DOWNTOWN EXTENSION PROJECT
ROLLING STOCK

JOB NO.: 65928-005
DATE: 6/6/96
BY: DAVE MINISTER

Description	Unit	Quantity	Unit Cost	Total ($000)
LOCOMOTIVE AND ELECTRIFICATION				
1500 - Volt DC Dual Mode Locomotive (GE Genesis IV or EMD)	EACH	23	$4.4Mil/Each	
equivalent				
2 Smaller Substations				
25kV AC Electric Power Trailer Units, including retrofitting of	EACH	23	$4.0/Mil Each	
diesel locomotives and cab cars				
New Diesel Locomotives	EACH	23	$3.5/Mil Each	
1 Substation - 25kV AC				
25kV AC Electric Locomotive (AEM-7 or equivalent)	EACH	23	$4.8/Mil/Each	
5 Substations - 25kV AC				

GALLERY CARS					
New Gallery Cars		EACH	15	$1.8 Mil/Each	

REC 6/10/96

CALTRAIN S.F. DOWNTOWN EXTENSION PROJECT

2010 PEAK HOUR RIDERSHIP PROJECTIONS AND REQUIRED CALTRAIN FLEET SIZE

A. 2010 CalTrain Peak Hour Ridership Projections

Please refer to **Final CalTrain Ridership Forecasting Results Report** prepared by Korve Engineering, June 1996, pp. 13, 28, 36 and 44.

1. Calculation of 2010 Peak Hour, Peak Direction Ridership:

Trip Purpose	2010 Daily Trips	Peak Hour, Peak--Direction Factor	Peak Hour, Peak-Direction Trips
Home-Based Work	28,185	0.21	5,920
Non-Work Trips	13,706	0.11	1,508
SFO Air Passengers	1,425	0.10	142
Total - All Purposes	**43,316**	**0.20**	**7,570**

2. Calculation of 2010 Peak Hour, Peak Direction, Peak Load Point Volume:

Assume the CalTrain peak load point volume is 0.80 times the total peak hour, peak direction volume (based on recent CalTrain on-board ridership surveys).

Then the 2010 CalTrain peak-hour, peak-direction, peak load point volume is ~7,570 x 0.80 = 6,056.

3. Calculation of 2010 Peak Hour, Non-Peak Direction Ridership:

The relationship of Non-Peak Direction Ridership to Peak Direction Ridership is 0.23 divided by 0.77 = 0.30 (Korve Engineering, based on MTC and San Mateo County Model Results for CalTrain for Year 2010).

Therefore, 7,570 peak direction trips x 0.30 = 2,270 non-peak direction trips.

Assume that the peak load point volume is about 0.80 x 2,270 non-peak direction trips = 1,816.

B. **CalTrain Passenger Car Needs to Carry Ridership Demand**

~6,056 peak-hour, peak direction passengers at peak load point÷by 7 peak-hour, peak direction trains = **~865 passengers per northbound train**;

~865 passengers÷by 145 passengers per car = **6 cars/train required on all AM peak-hour northbound trains;**

Similarly, **~1,816 peak-hour, reverse direction passengers**÷by 4 peak-hour, reverse direction trains = **~450 passengers per southbound train**;

~450 passengers÷by 145 passengers per car = **3 cars/train required to handle the reverse commute demand**;

A total of 18 trains are required to operate the peak-hour CalTrain schedule for the 86 trains/day schedule. ~Nine of these trains need to have 6 cars each, and the remaining nine would need to have 4 to 5 cars each during peak periods in the Year 2010 to meet the forecast ridership demand.

Thus the required 2010 CalTrain Passenger Car Requirements are estimated to be as follows:

- 9 trains @ 6 gallery cars each = 54 cars;
- 9 trains @ 4.5 gallery cars each = 41 cars;

Total = 18 trains and 95 cars;

Spares @ 15% = 15 cars;

Total Gallery Cars Required = 110 Gallery Cars;

Existing CalTrain fleet = 73 gallery cars + 17 gallery cars to be re-ordered*= 90 cars; therefore ~20 new gallery cars will be required by the Year 2010 to handle the forecast ridership demand.

The capital costs for acquiring these 20 additional gallery cars is estimated to be about 20 @ $1.8 million each = $36 million plus ~17% add-ons for procurement costs, contingencies and project reserve = $42 million.

CALTRAIN DOWNTOWN EXTENSION PROJECT
SAN FRANCISCO, CALIFORNIA

PROPOSED PARKING LOT EXPANSION SUMMARY

EXPANSION PARKING LOTS	CONSTRUCTION COST						ROW/RELOC COST		
	LOT AREA (SF)	SPACES (EA)	COST/ SPACE ($)	LOT COST ($)	ACCESS ($)	TOTAL ($)	RIGHT OF WAY ($)	RELOC COST ($)	TOTAL ($)
22ND STREET	6,098	22	3,000	66,000	50,000	116,000	152,460	0	152,460
SO. SAN FRANCISCO	31,799	100	3,000	300,000	100,000	400,000	540,580	0	540,580
SAN BRUNO	13,594	50	3,000	150,000	50,000	200,000	0	0	0
BROADWAY	38,333	130	3,000	390,000	325,000	715,000	1,045,440	200,000	1,245,440
BURLINGAME	23,086	175	3,000	525,000	300,000	825,000	0	0	0
SAN MATEO	91,040	65	3,000	195,000	100,000	295,000	0	0	0
HILLSDALE	74,923	556	6,300	3,502,800	250,000	3,752,800	3,459,340	500,000	3,959,340
BELMONT	76,666	245	3,000	735,000	250,000	985,000	2,330,460	0	2,330,460
SAN CARLOS	84,506	205	3,000	615,000	150,000	765,000	2,957,724	0	2,957,724
MENLO PARK	54,014	150	3,000	450,000	100,000	550,000	810,216	0	810,216
PALO ALTO	32,234	80	3,000	240,000	200,000	440,000	601,128	0	601,128
CALIFORNIA AVENUE	12,900	45	3,000	135,000	200,000	335,000	0	0	0
SANTA CLARA	23,958	65	3,000	195,000	100,000	295,000	0	100,000	100,000
TOTAL	**563,151**	**1,888**		**7,498,800**	**2,175,000**	**9,673,800**	**11,897,348**	**800,000**	**12,697,348**

ICF KAISER ENGINEERS

Job No. 65928-005-06

Sheet 1 of 1

DESIGNED BY H.W.H. DATE 5/16/96

CHECKED BY DATE

Parking

22nd St.

1 Arrow = 50,000

San Bruno

Cover Drainage Channel @ 50,000

Burlingame

6 Arrows = 300,000

San Mateo

2 Arrow = 100,000

Belmont

5 Arrows = 250,000

San Carlos

3 Arrows = 150,000

Palo Alto

4 Arrows = 200,000

Mountain View

~~175,000 = 1 Arrow,~~
~~Bldg. & Rail Removal~~
~~Reloc. Invest. @ 150,000~~

Santa Clara

1 Arrow @ 50,000
Removals = 50,000
100,000

Replace @ 100,000

So. San Francisco

2 Arrows = 100,000

Broadway

5 Arrows = 150,000
Demo. Gas Sta. & Car wash } 175,000
325,000
Reloc. Proprietors 200,000

Hillsdale

4 Arrows = 200,000
Demo. Store = 50,000
250,000
Reloc. Owner = 150,000

Menlo Park

2 Arrows = 100,000

Calif. Ave.

3 Arrows, But Length of Easement Justifies 200,000

Sunnyvale

~~3 Arrows = 150,000~~
~~Demo. Part of Big Bldg. 100,000~~
~~250,000~~
~~Reconst. Bldg. 200,000~~

CALCULATIONS KE Form No. E-6 Rev. 12-89

CALTRAIN DOWNTOWN EXTENSION PROJECT
SAN FRANCISCO, CALIF.

RIGHT-OF-WAY & RELOCATION

SEGMENT DESCRIPTION	SEG #	R.O.W. PURCHASE	R.O.W. RESALE (NET)	R.O.W. TOTAL	RELOCATION	TOTAL
APPROX. BERRY & SEVENTH TO APPROX. THIRD & TOWNSEND VIA AT GRADE, RETAINED CUT AND CUT & COVER. PORTAL ON TOWNSEND BETWEEN FIFTH AND FOURTH.	1A	$0		$0	$0	$0
APPROX. BERRY & SEVENTH TO APPROX. THIRD AND TOWNSEND VIA AT GRADE, RETAINED CUT AND CUT & COVER. PORTAL ON TOWNSEND NEAR FOURTH.	1B	$0		$0	$0	$0
BETWEEN IRWIN & HOOPER ON SEVENTH TO NEAR THIRD & TOWNSEND VIA AT GRADE, RETAINED CUT AND CUT & COVER. PORTAL ON SEVENTH BETWEEN BERRY & HOOPER.	1C	$0		$0	$0	$0
APPROX. THIRD AND TOWNSEND TO APPROX, BRYANT ST. VIA MINED TUNNEL ON LONG CURVE.	2A	$550,000		$550,000		$550,000
APPROX. THIRD & TOWNSEND TO APPROX. BRYANT ST. VIA MINED TUNNEL ON MEDIUM CURVE.	2B	$2,400,000		$2,400,000	$250,000	$2,650,000
APPROX.THIRD & TOWNSEND TO APPROX. BRYANT ST. VIA MINED TUNNEL ON SHORT CURVE.	2C	$2,425,000		$2,425,000	$250,000	$2,675,000
APPROX. BRYANT ST. TO BETWEEN FOLSOM AND CLEMENTINA VIA MINED TUNNEL.	3	$0			$0	$0
BETWEEN FOLSON AND CLEMENTINA TO BETWEEN MINNA AND NATOMA WEST OF FIRST ST. VIA CUT & COVER.	4	$2,000,000		$2,000,000	$300,000	$2,300,000

CALTRAIN DOWNTOWN EXTENSION PROJECT
SAN FRANCISCO, CALIF.

RIGHT-OF-WAY & RELOCATION

SEGMENT DESCRIPTION	SEG #	R.O.W. PURCHASE	R.O.W. RESALE (NET)	R.O.W. TOTAL	RELOCATION	TOTAL
TRANSBAY TERMINAL SUBWAY STA. BETWEEN MINNA AND NATOMA WEST OF FIRST TO BEALE ST. (HIGH RISE)	5A	$2,700,000		$2,700,000	$500,000	$3,200,000
TRANSBAY TERMINAL SUBWAY STA. BETWEEN MINNA AND NATOMA WEST OF FIRST TO BEALE ST. (BUS TERMINAL - TRANSBAY SHORT)	5B	$2,700,000		$2,700,000	$500,000	$3,200,000
TRANSBAY TERMINAL SUBWAY STA. BETWEEN MINNA AND NATOMA WEST OF FIRST TO BEALE ST. (BUS TERMINAL - TRANSBAY MEDIUM)	5C	$2,700,000		$2,700,000	$500,000	$3,200,000
16TH ST. AND OWENS ST. STORAGE YARD (OPTION A)	SW3A				$1,000,000	$1,000,000
16TH ST. AND OWENS ST. STORAGE YARD (OPTION B)	SW3B				$1,000,000	$1,000,000
16TH ST. AND OWENS ST. STORAGE YARD (OPTION C)	SW3C				$1,000,000	$1,000,000
TOWNSEND ST. STORAGE YARD	SW4	$0			$0	$0

the lower costs for underpinning might offset the highest cost associated with the greatest length of the "short radius" tunnel.

6. The "short radius" tunnel alignment passes under the empty lots at 251 and 257 Brannan Street. It is our understanding that a high-rise building is at the design stage for the 251 Brannan lot. We recommend that the CalTrain project make provisions and also enter into negotiations with the owner of the new structure, so that the design of the new structure can accommodate the CalTrain tunnels without having to underpin the new structure. In effect, what is required is to incorporate the underpinning into the design and construction plans for the new building.

SAY $250,000

7. It is our opinion that the option involving twin bore shield-driven tunnels is the most risky of the three tunneling options considered. Working inside a shield does not provide as much flexibility in terms of excavation and treatment methods, as working inside the bigger opening of the single tunnel. In addition, the need for reinforcing the rather narrow pillar between the two bores seems to introduce an unnecessary operation that complicates the construction process. As mentioned earlier, the dewatering inside the smaller opening of the two bores will also be more difficult and expensive. But the most important consideration is the potential for significant slowdown in production rates if there is a need to alternate frequently between roadheader excavation and blasting, because of the high degree of variability of the rock. Finally, there is the concern that a cave-in, unlikely as it might seem, could trap the shield causing significant delays in the work. In such a case, to free the shield it will be necessary to excavate a shaft from the surface causing significant disruption to traffic and other facilities. Because of just such problems during construction of the Athens Metro, the use of shield excavation through poor ground conditions was discontinued (Civil Engineer International).

In view of the concerns with shield driven tunnels, we recommend that this option not be considered further, unless these issues are addressed in detail during the preliminary engineering phase of the project, and unless this option proves to be

ICF KAISER ENGINEERS 09/19/96 10:52:38
CalTrain Downtown Extension BY KSK
JOB NO. 65928-005-06 MARK-UPS USED FOR CALCULATIONS

TABLE : SEG - STANDARD ADDONS AT SEGMENT LVL

DESCRIPTION	%	ENGRG. %	CONTIN %	ESCAL. %	RESERV %
ROUTE LENGTH					
TRACK LENGTH					
SITE MODIFICATIONS:					
-DEMOLITION		25.0	30.0		8.0
-UTILITY RELOCATIONS/MODIFICATIONS		25.0	25.0		8.0
-STREET AND ROAD MODIFICATIONS		25.0	30.0		8.0
-RAILROAD MODIFICATIONS		25.0	30.0		8.0
-STRUCTURE MODIFICATIONS		25.0	30.0		8.0
-UNDERPINNING		25.0	25.0		8.0
-ENVIRONMENTAL MITIGATIONS		25.0	25.0		8.0
TRACKWAY - AERIAL		25.0	20.0		8.0
TRACKWAY - AT GRADE		25.0	30.0		8.0
TRACKWAY - RETAINED CUT		25.0	20.0		8.0
SUBWAY:					
-CUT AND COVER (SPTC WALLS), 2-TRACK		25.0	20.0		8.0
-CUT AND COVER (SOIL-CEMENT WALLS)		25.0	20.0		8.0
-CUT AND COVER (MESH/ROCK BOLTS)		25.0	20.0		8.0
-MINED TUNNEL		25.0	20.0		8.0
TERMINAL - STRUCT/FINISH		25.0	20.0		8.0
AT GRADE STATION, 2 680' SIDE PLATFORMS		25.0	20.0		8.0
TRACKWORK - BALLASTED		25.0	15.0		8.0
TRACKWORK - DIRECT FIXATION		25.0	15.0		8.0
SPECIAL TRACKWORK, TURNOUTS, ETC.		25.0	15.0		8.0
TRACTION POWER SYSTEM (SYS WIDE)		25.0	20.0		8.0
SIGNALING - WAYSIDE AND STATION		25.0	25.0		8.0
COMMUNICATIONS (SYSTEM WIDE)		25.0	25.0		8.0
YARDS & SHOPS (SYSTEM WIDE)		25.0	25.0		8.0
GALLERY CARS (SYSTEMWIDE)		3.0	10.0		3.0
LOCOMOTIVES (SYSTEMWIDE)		3.0	10.0		3.0
DIESEL LOCOMOTIVE REPLACEMENT CREDIT		3.0	10.0		3.0
PARK & RIDE LOTS & ACCESS IMPROVEMENTS		25.0	30.0		8.0
RIGHT OF WAY & RELOCATION		10.0	25.0		8.0
ENGINEERING & MANAGEMENT			20.0		8.0
CONTINGENCY					8.0
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:37
BY KSK
REV No. E

SEGMENT: 1A - BERRY TO 3RD & TOWN, OPTION A

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	3975.0			
TRACK LENGTH	TF	8730.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3975.0	1097	30.0	329
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3975.0	3911	25.0	978
-STREET AND ROAD MODIFICATIONS	RF	3975.0	1578	30.0	473
-RAILROAD MODIFICATIONS	LS	1.0	500	30.0	150
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	525	25.0	131
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF	2350.0	235	30.0	71
TRACKWAY - RETAINED CUT	RF	660.0	5320	20.0	1064
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965.0	21532	20.0	4306
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1.0	1789	20.0	358
TRACKWORK - BALLASTED	TF	4700.0	620	15.0	93
TRACKWORK - DIRECT FIXATION	TF	3250.0	748	15.0	112
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	740	15.0	111
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$38595		$8176
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			9649	20.0	1930
Subtotal NON-CONSTRUCTION COSTS :			$9649		$1930
CONTINGENCY					
CONTINGENCY			10106		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			4668		
Subtotal :			$63018		$10106

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:38
BY KSK
REV No. E

SEGMENT: 1B - BERRY TO 3RD & TOWN, OPTION B

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	3935.0			
TRACK LENGTH	TF	8650.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	3935.0	1019	30.0	306
-UTILITY RELOCATIONS/MODIFICATIONS	RF	3935.0	3573	25.0	893
-STREET AND ROAD MODIFICATIONS	RF	3935.0	866	30.0	260
-RAILROAD MODIFICATIONS	LS	1.0	500	30.0	150
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	516	25.0	129
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF	2310.0	231	30.0	69
TRACKWAY - RETAINED CUT	RF	660.0	5320	20.0	1064
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	965.0	23556	20.0	4711
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA	1.0	1491	20.0	298
TRACKWORK - BALLASTED	TF	4620.0	610	15.0	92
TRACKWORK - DIRECT FIXATION	TF	4030.0	927	15.0	139
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	665	15.0	100
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$39274		$8211
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			9819	20.0	1964
Subtotal NON-CONSTRUCTION COSTS :			$9819		$1964
CONTINGENCY					
CONTINGENCY			10175		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			4741		
Subtotal :			$64009		$10175

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:39
BY KSK
REV No. E

SEGMENT: 1C - IRWIN TO 3RD & TOWN, OPTION C

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	4800.0			
TRACK LENGTH	TF	10380.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	4800.0	1224	30.0	367
-UTILITY RELOCATIONS/MODIFICATIONS	RF	4800.0	13714	25.0	3429
-STREET AND ROAD MODIFICATIONS	RF	4800.0	1330	30.0	399
-RAILROAD MODIFICATIONS	LS	1.0	500	30.0	150
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	500	25.0	125
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF	170.0	17	30.0	5
TRACKWAY - RETAINED CUT	RF	700.0	5642	20.0	1128
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	3950.0	82110	20.0	16422
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF	340.0	45	15.0	7
TRACKWORK - DIRECT FIXATION	TF	10040.0	2309	15.0	346
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	390	15.0	59
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$107781		$22437
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			26945	20.0	5389
Subtotal NON-CONSTRUCTION COSTS :			$26945		$5389
CONTINGENCY					
CONTINGENCY			27826		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			13004		
Subtotal :			$175556		$27826

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:40
BY KSK
REV No. E

SEGMENT: 2A - MINED TUNNEL, LONG CURVE

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	2215.0			
TRACK LENGTH	TF	4430.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	60.0	6	30.0	2
-UTILITY RELOCATIONS/MODIFICATIONS	RF	60.0	1071	25.0	268
-STREET AND ROAD MODIFICATIONS	RF	60.0	120	30.0	36
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS	1.0	2500	25.0	625
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF	2215.0	52264	20.0	10453
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	4430.0	1019	15.0	153
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$56980		$11536
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	550	25.0	138
ENGINEERING & MANAGEMENT			14300	20.0	2860
Subtotal NON-CONSTRUCTION COSTS :			$14850		$2998
CONTINGENCY					
CONTINGENCY			14534		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			6909		
Subtotal :			$93273		$14534

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:41
BY KSK
REV No. E

SEGMENT: 2B - MINED TUNNEL, MEDIUM CURVE

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	2400.0			
TRACK LENGTH	TF	4800.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	150.0	15	30.0	5
-UTILITY RELOCATIONS/MODIFICATIONS	RF	150.0		25.0	
-STREET AND ROAD MODIFICATIONS	RF	150.0	75	30.0	23
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS	1.0	1600	25.0	400
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF	2400.0	53362	20.0	10672
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	4800.0	1104	15.0	166
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$56156		$11265
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	2650	25.0	663
ENGINEERING & MANAGEMENT			14304	20.0	2861
Subtotal NON-CONSTRUCTION COSTS :			$16954		$3523
CONTINGENCY					
CONTINGENCY			14788		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			7032		
Subtotal :			$94930		$14788

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:42
BY KSK
REV No. E

SEGMENT: 2C - MINED TUNNEL, SHORT CURVE

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	2575.0			
TRACK LENGTH	TF	5150.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	150.0	15	30.0	5
-UTILITY RELOCATIONS/MODIFICATIONS	RF	150.0		25.0	
-STREET AND ROAD MODIFICATIONS	RF	150.0	75	30.0	23
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS	1.0	1000	25.0	250
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF	2575.0	56085	20.0	11217
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	5150.0	1185	15.0	178
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$58360		$11672
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	2675	25.0	669
ENGINEERING & MANAGEMENT			14858	20.0	2972
Subtotal NON-CONSTRUCTION COSTS :			$17533		$3640
CONTINGENCY					
CONTINGENCY			15312		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			7296		
Subtotal :			$98501		$15312

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:43
BY KSK
REV No. E

SEGMENT: 3 - MINED TUNNEL, BRYANT TO FOLSOM

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	1325.0			
TRACK LENGTH	TF	2650.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			25.0	
-STREET AND ROAD MODIFICATIONS	RF			30.0	
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS	1.0	200	25.0	50
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF	1325.0	27356	20.0	5471
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	2650.0	610	15.0	92
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$28166		$5613
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			7042	20.0	1408
Subtotal NON-CONSTRUCTION COSTS :			$7042		$1408
CONTINGENCY					
CONTINGENCY			7021		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			3378		
Subtotal :			$45607		$7021

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CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:44
BY KSK
REV No. E

SEGMENT: 4 - CUT & COVER, APPROACH TO TBT

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	990.0			
TRACK LENGTH	TF	5260.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	990.0	500	30.0	150
-UTILITY RELOCATIONS/MODIFICATIONS	RF	990.0	2025	25.0	506
-STREET AND ROAD MODIFICATIONS	RF	990.0	246	30.0	74
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	100	25.0	25
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF	990.0	35229	20.0	7046
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	5260.0	1210	15.0	182
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	610	15.0	92
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$39920		$8074
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	2300	25.0	575
ENGINEERING & MANAGEMENT			10210	20.0	2042
Subtotal NON-CONSTRUCTION COSTS :			$12510		$2617
CONTINGENCY					
CONTINGENCY			10691		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			5050		
Subtotal :			$68171		$10691

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CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:45
BY KSK
REV No. E

SEGMENT: 5A - 6 TRK TRNSBAY T'MINAL, HIRISE

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	1035.0			
TRACK LENGTH	TF	5130.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0		30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1035.0	1947	25.0	487
-STREET AND ROAD MODIFICATIONS	RF	1035.0	494	30.0	148
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2874	25.0	719
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA	1.0	80587	20.0	16117
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	5130.0	1180	15.0	177
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	30	15.0	5
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$87112		$17652
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3200	25.0	800
ENGINEERING & MANAGEMENT			22098	20.0	4420
Subtotal NON-CONSTRUCTION COSTS :			$25298		$5220
CONTINGENCY					
CONTINGENCY			22872		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			10823		
Subtotal :			$146105		$22872

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:46
BY KSK
REV No. E

SEGMENT: 5B - 6 TRK T'BAY T'MINAL W/TB SHORT

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	1035.0			
TRACK LENGTH	TF	5130.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0		30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1035.0	1947	25.0	487
-STREET AND ROAD MODIFICATIONS	RF	1035.0	494	30.0	148
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	1395	25.0	349
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA	1.0	76242	20.0	15248
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	5130.0	1180	15.0	177
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	30	15.0	5
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$81288		$16414
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3200	25.0	800
ENGINEERING & MANAGEMENT			20642	20.0	4128
Subtotal NON-CONSTRUCTION COSTS :			$23842		$4928
CONTINGENCY					
CONTINGENCY			21342		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			10118		
Subtotal :			$136590		$21342

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CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:47
BY KSK
REV No. E

SEGMENT: 5C - 6TRK T'BAY T'MINAL W/ TBMEDIUM

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	1035.0			
TRACK LENGTH	TF	5130.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0		30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1035.0	1947	25.0	487
-STREET AND ROAD MODIFICATIONS	RF	1035.0	494	30.0	148
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	1395	25.0	349
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA	1.0	78529	20.0	15706
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	5130.0	1180	15.0	177
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	30	15.0	5
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$83575		$16871
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3200	25.0	800
ENGINEERING & MANAGEMENT			21214	20.0	4243
Subtotal NON-CONSTRUCTION COSTS :			$24414		$5043
CONTINGENCY					
CONTINGENCY			21914		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			10392		
Subtotal :			$140295		$21914

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:48
BY KSK
REV No. E

SEGMENT: 5D - 6 TRK T'BAY T'MINAL, NO HIRISE

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF	1035.0			
TRACK LENGTH	TF	5130.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0		30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1035.0	1947	25.0	487
-STREET AND ROAD MODIFICATIONS	RF	1035.0	494	30.0	148
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2874	25.0	719
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA	1.0	78657	20.0	15731
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF	5130.0	1180	15.0	177
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	30	15.0	5
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$85182		$17266
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	3200	25.0	800
ENGINEERING & MANAGEMENT			21616	20.0	4323
Subtotal NON-CONSTRUCTION COSTS :			$24816		$5123
CONTINGENCY					
CONTINGENCY			22390		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			10591		
Subtotal :			$142979		$22390

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CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:49
BY KSK
REV No. E

SEGMENT: 5PS - PEDESTRIAN SUBWAY TO BART STA

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	1621	25.0	405
-STREET AND ROAD MODIFICATIONS	RF	1.0	450	30.0	135
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA	1.0	20209	20.0	4042
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$22280		$4582
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			5570	20.0	1114
Subtotal NON-CONSTRUCTION COSTS :			$5570		$1114
CONTINGENCY					
CONTINGENCY			5696		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			2684		
Subtotal :			$36230		$5696

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:50
BY KSK
REV No. E

SEGMENT: SW1A - 1500V DC IN SF,DUAL MODE LOCOS

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			25.0	
-STREET AND ROAD MODIFICATIONS	RF			30.0	
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	9830	20.0	1966
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA	23.0	101200	10.0	10120
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$111030		$12086
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			5494	20.0	1099
Subtotal NON-CONSTRUCTION COSTS :			$5494		$1099
CONTINGENCY					
CONTINGENCY			13185		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			5317		
Subtotal :			$135026		$13185

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:51
BY KSK
REV No. E

SEGMENT: SW1B - 25KV AC IN SF, POWER TRAILER

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			25.0	
-STREET AND ROAD MODIFICATIONS	RF			30.0	
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
AT GRADE STATION, 2 680' SIDE PLATFORMS	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	6723	20.0	1345
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA	23.0	172500	10.0	17250
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$179223		$18595
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			6856	20.0	1371
Subtotal NON-CONSTRUCTION COSTS :			$6856		$1371
CONTINGENCY					
CONTINGENCY			19966		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			7859		
Subtotal :			$213904		$19966

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:52
BY KSK
REV No. E

SEGMENT: SW2 - 25KV AC, SF TO GILROY

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			25.0	
-STREET AND ROAD MODIFICATIONS	RF			30.0	
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA	1.0	70484	20.0	14097
SIGNALING - WAYSIDE AND STATION	LS	1.0	20100	25.0	5025
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	500	25.0	125
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA	23.0	110400	10.0	11040
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$201484		$30287
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			26083	20.0	5217
Subtotal NON-CONSTRUCTION COSTS :			$26083		$5217
CONTINGENCY					
CONTINGENCY			35503		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			15526		
Subtotal :			$278596		$35503

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:53
BY KSK
REV No. E

SEGMENT: SW3A - 16TH & OWENS YARD, OPTION A

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF	14775.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	808	30.0	242
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	122	25.0	31
-STREET AND ROAD MODIFICATIONS	RF			30.0	
-RAILROAD MODIFICATIONS	LS	1.0	500	30.0	150
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF	14475.0	2244	15.0	337
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	974	15.0	146
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	4875	25.0	1219
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$9523		$2124
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1000	25.0	250
ENGINEERING & MANAGEMENT			2481	20.0	496
Subtotal NON-CONSTRUCTION COSTS :			$3481		$746
CONTINGENCY					
CONTINGENCY			2871		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			1270		
Subtotal :			$17145		$2871

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:54
BY KSK
REV No. E

SEGMENT: SW3B - 16TH ST STORAGE YARD, OPTION B

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF	16210.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	808	30.0	242
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	122	25.0	31
-STREET AND ROAD MODIFICATIONS	RF			30.0	
-RAILROAD MODIFICATIONS	LS	1.0	500	30.0	150
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF	16210.0	2513	15.0	377
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	1124	15.0	169
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	4875	25.0	1219
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$9942		$2187
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1000	25.0	250
ENGINEERING & MANAGEMENT			2586	20.0	517
Subtotal NON-CONSTRUCTION COSTS :			$3586		$767
CONTINGENCY					
CONTINGENCY			2954		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			1319		
Subtotal :			$17801		$2954

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:55
BY KSK
REV No. E

SEGMENT: SW3C - 16TH ST STORAGE YARD, OPTION C

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF	12130.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF	1.0	808	30.0	242
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	122	25.0	31
-STREET AND ROAD MODIFICATIONS	RF			30.0	
-RAILROAD MODIFICATIONS	LS	1.0	500	30.0	150
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF	12130.0	1880	15.0	282
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	653	15.0	98
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	5735	25.0	1434
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$9698		$2237
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	1000	25.0	250
ENGINEERING & MANAGEMENT			2525	20.0	505
Subtotal NON-CONSTRUCTION COSTS :			$3525		$755
CONTINGENCY					
CONTINGENCY			2992		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			1297		
Subtotal :			$17512		$2992

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:56
BY KSK
REV No. E

SEGMENT: SW4 - TOWNSEND ST. STORAGE YARD

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF	19010.0			
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	86	25.0	22
-STREET AND ROAD MODIFICATIONS	RF			30.0	
-RAILROAD MODIFICATIONS	LS	1.0	500	30.0	150
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF	19010.0	2947	15.0	442
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS	1.0	975	15.0	146
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA	1.0	4917	25.0	1229
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$9425		$1989
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			2356	20.0	471
Subtotal NON-CONSTRUCTION COSTS :			$2356		$471
CONTINGENCY					
CONTINGENCY			2460		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			1139		
Subtotal :			$15380		$2460

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

08/27/96 11:26:57
BY KSK
REV No. E

SEGMENT: SW9 - COMMON SYSTEMWIDE ELEMENTS

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF			25.0	
-STREET AND ROAD MODIFICATIONS	RF			30.0	
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS			25.0	
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA			20.0	
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS	1.0	3376	25.0	844
COMMUNICATIONS (SYSTEM WIDE)	TF	1.0	6639	25.0	1660
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA	15.0	27000	10.0	2700
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA	23.0	-80500	10.0	-8050
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP	1.0	9674	30.0	2902
Subtotal CONSTRUCTION COSTS :			$-33811		$56
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA	1.0	12697	25.0	3174
ENGINEERING & MANAGEMENT			4587	20.0	917
Subtotal NON-CONSTRUCTION COSTS :			$17284		$4092
CONTINGENCY					
CONTINGENCY			4148		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			1685		
Subtotal :			$-10694		$4148

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
181	HAZARDOUS WASTE DISPOSAL									
181 .02	SITEWORK									
MB NORTH 181 .0220251.	HAUL & DISPOSE OF HAZARDOUS WASTE FROM SUBSURF PARKING BUS TERM ALT MB NORTH	28730 CY	0	0	0	0	2442050	0	122103	2564153
SEG 5 181 .0220252.	HAUL & DISPOSE OF HAZARDOUS WASTE FROM TRANSBAY TERM SUBWAY STATION	18100 CY	0	0	0	0	1538500	0	76925	1615425
TOTAL	SITEWORK		0	0	0	0	3,980,550	0	199,028	4,179,578
TOTAL	HAZARDOUS WASTE DISPOSAL		0	0	0	0	3,980,550	0	199,028	4,179,578
REPORT TOTAL			0	0	0	0	3,980,550	0	199,028	4,179,578

ICF KAISER	JOB NO. 65928-005-06	
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT	CALC. NO.	REV.
	SHEET	OF
	DESIGNED BY R. Moore	DATE 5-13-96
BUS FACILITIES	CHECKED BY Rev.4 K. Kalsi	DATE 8/22/96

Stage construction information obtained from "Stage Construction Drawings, #182-186 and P.B.'s/J.P.B.'s comments (8-19-96).

ESTIMATE FOR PRIMARY ALTERNATIVE, MAIN-BEALE NORTH BUS TERMINAL

QUANTITY AND UNIT COST SUMMARY

	Stage										Total Qty.	Units	Unit Cost	Total Cost	Comments
	0, 0.1, 1.0	1.1	2.0	2.1	2.2	2.3	2.4	2.5	2.6	3					
Concrete	0	43,721	0	9,092	0	0	6,392	0	375	27420	86,999	CY	$ 37.00	$ 3,218,978	See Stage 0,0.1,1.0 sheet
Demolition	0	0	0	0	0	0	0	0	0	15700	15,700	CY	$ 93.45	$ 1,467,165	Unit cost per KE TBT Demo est.
Steel Demolition	0	1,150	0	0	0	0	0	0	0	3600	4,750	TN	$ 219.0	$ 1,040,250	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Roofing And Siding Demo.	0	0	0	0	0	0	0	0	0	26000	26,000	CY	$ 40.4	$ 1,049,620	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Demo. Misc. TBT material	0	0	0	0	0	0	0	0	0	1	1	LS	$ 824,250.0	$ 824,250	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Ramp Construction	0	0	102,864	0	47,450	8760	0	35,200	0	0	194,274	SF	$ 120.0	$ 23,312,880	Dim. from aerial photo scale Unit cost per P.B. estimate
MB Term Construction	0	0	1	0	0	0	0	0	0	0	1	EACH	$ 60,124,050	$ 60,124,050	Unit cost from P.B. estimate
Temporary Bus Storage	1	0	0	0	0	0	0	0	0	0	1	LS	$ 931,431	$ 931,431	Dim. from aerial photo scale Unit cost per ICF KE estimate
Temp. Bus Turn Around	1	0	0	0	0	0	0	0	0	0	1	Allow	$ 300,000	$ 300,000	
2nd Street Approach	0	0	0	0	0	0	0	0	6,600	0	6,600	SF	$ 25	$ 165,000	Unit cost & count from P.B. estimate
Street & Road Modifications	0	0	0.5	0	0	0	0	0	0	0	0.5	Each	$ 640,770	$ 320,385	Unit cost & count from P.B. estimate
Utility Relocation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	Allow	$ 200,000	$ 200,000	
Traffic Control	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	LS	$ 262,500	$ 262,500	Dim & unit cost from KE TBT demo. estimate.

SUBTOTAL - MAIN-BEALE NORTH BUS TERMINAL =		$ 93,216,509
RIGHT-OF-WAY=		$ 3,000,000
ENGINEERING & ADMINISTRATION =	25%	$ 23,304,127
CONTINGENCY =	25%	$ 29,130,170
PROJECT RESERVE =	8%	$ 11,652,068
TOTAL - MAIN-BEALE NORTH BUS TERMINAL =		$ 160,302,875

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY _____ DATE _____

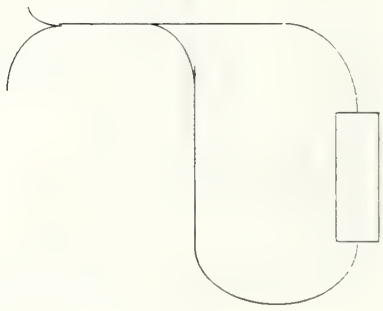
Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 0 Existing Condition
Stage 0.1 Caltrans Constructs New Fremont Street Off-Ramp

Stage 1.0 Modify Existing Bus Terminal

Modify Existing Terminal:



Temporary Storage for Buses: (See estimate by ICF KE)

Total =	$931,431

CALCULATION FOR UNIT COST OF RAMP DEMOLITION

Per phone conversation with P.B. rep (August 16, 1996), cost per square foot of concrete ramp demolition should be approximately $13.00/SF. Convert to cubic yard unit cost.

Ramp demolition area = 289,000 sf
Ramp demolition volume = 102,699 cy

($13.00/SF)*(289,000 SF / 102,699 CY) = $ 36.58 / CY

USE $37.00 / CY

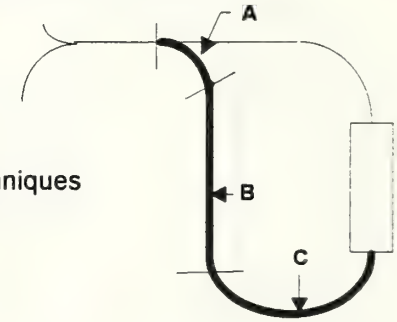
ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 1.1 Demolish Inbound Bus Loop and Fremont Street Off-Ramp Parallel to Folsom Street

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.

Superstructure: (average depth = approx. 4.5' for concrete girders & 3' for steel girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
Area A =	350	80	4.5	1.5	189,000	7,000
Area B (bus) =	1000	30	4.5	1.5	202,500	7,500
Area B (vehicle)	620	30	4.5	1.5	125,550	4,650
Area C =	900	75	3	1.5	303,750	11,250
Total =						30,400 CY

Columns:

Concrete:

	Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
Area A =	18	30	25	1.5	20250	750
Area B =	83	30	25	1.5	93375	3,458
Area C =	38	30	25	1.5	42750	1,583
						5,792 CY

Bent Cap:

Bent cap volume = approx. = 30% column 1,738 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column 5,792 CY

TOTAL CONCRETE DEMO. THIS PAGE = 43,721 CY

Steel:

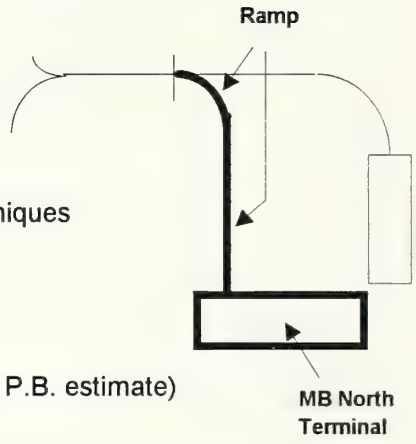
Girders supporting deck in area "C" = 1,150 Tons

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY DATE

Stage construction information obtained from "Stage Construction Drawings, #182-186
Area for the new MB North access ramp was adjusted per letter from J.P.B, dated 8-19-96

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 2.0 Construct New Bus Terminal and Ramp, Construct Shoo-fly for Stage 2.1



Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.

New MB North access ramp: (unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	1201	64	76,864	← Note values changed per letter from J.P.B. dated 8-19-96
	200	130	26,000	
			102,864	ft^2

New MB North (aerial) Transit Terminal:

		For Backup, See Attachment Sheet
Terminal : (see P.B. estimate for cost breakdown)	$ 51,643,963	1
Less P.B.'s "Foundation - TBT (Partial)"	$ (3,245,074)	1
Plus ICF KE Foundation Cost Allowance	$ 7,000,000	
Plus P.B.'s "Grade level elements ($3,763,125 less factors)"	$ 2,229,511	3
All costs applied to Bus. Not Shared with Caltrain		
Plus P.B.'s "Grade level elements upgrades ($4,211,409 less factors)"	$ 2,495,650	4
~~Plus allowance for aerial pedestrian walkway (say $1,000,000)~~	~~$ 1,000,000~~	
Total MB North Transit Terminal =	$ 60,124,050	

Street & Road Modifications: 1 (see P.B. estimate for cost breakdown)

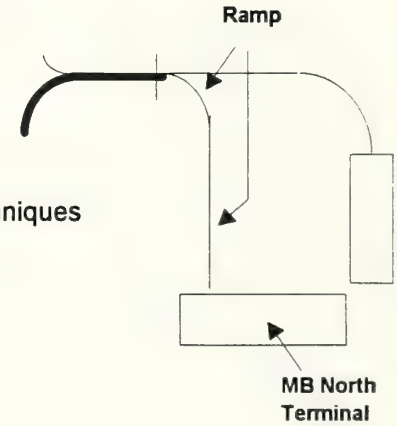
Per P.B. Estimate Street and Roadway Modifications =	$ 340,770
Includes 2 traffic signals	
Add $300,000 for misc. modifications =	$ 300,000
	$ 640,770

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 2.1 Demolish remaining Fremont street off-ramp parallel to Essex street



Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.

Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	1200	22	4.5	1.5	178,200	6,600 CY

Columns:

Concrete:

	Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
	26	30	25	1.5	29250	1,083 CY

Bent Cap:

Bent cap volume = approx. = 30% column	325 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column	1,083 CY

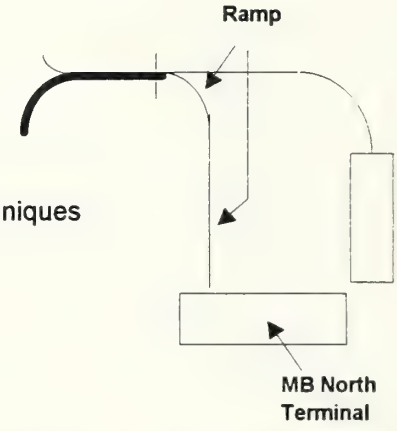
TOTAL CONCRETE DEMO. THIS PAGE =	9,092 CY

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 2.2 Construct East half of new bus ramp parallel to Essex St.



Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.

New bus ramp (part) parallel. to Essex: (unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	650	73	47,450	
			47,450	ft^2

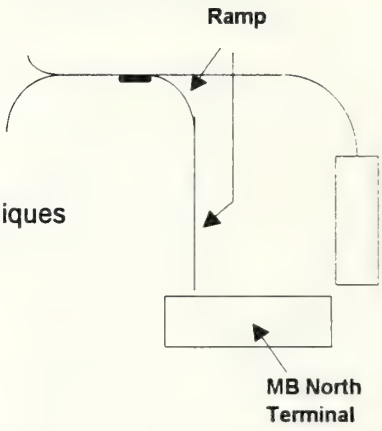
TOTAL NEW CONCRETE THIS PAGE =	47,450 SF

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 2.3 Construct East half of new bus ramp over Folsom Street



Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto

New bus ramp (part) parallel. to Essex over Folsom:

(unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	120	73	8,760	
			8,760	ft^2

TOTAL THIS PAGE =	8,760 SF

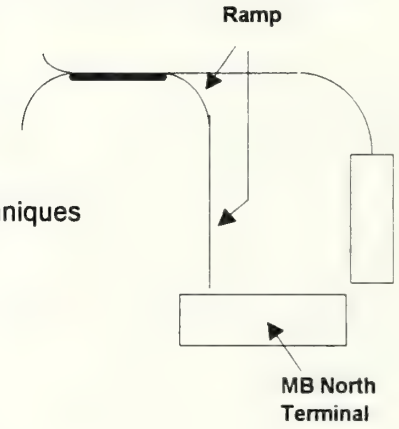
ICF KAISER	JOB NO. 65928-005-09
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-10-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 2.4 Demolish Existing Bus Ramp (Original Train Structure) Between Harrison and Folsom Street

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.

Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	750	30	4.5	1.5	151,875	5,625 CY

Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
16	15	25	1.5	9000	333 CY

Bent Cap:

Bent cap volume = approx. = 30% column 100 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column 333 CY

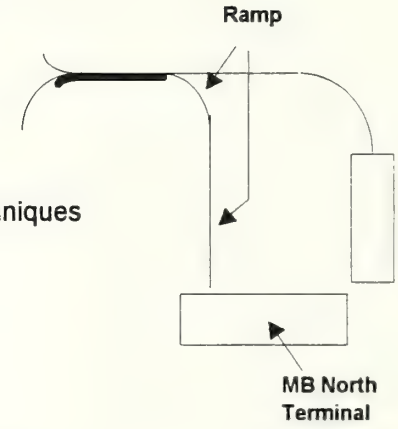
TOTAL CONCRETE DEMO. THIS PAGE = 6,392 CY

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 2.5 Construct West Half of New Bus Ramp Parallel to Essex Street



Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.

New bus ramp (part) West Half parallel. to Essex over Folsom:
(unit cost to be applied $125.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	1100	32	35,200	
			35,200	ft^2

TOTAL THIS PAGE =	35,200 SF

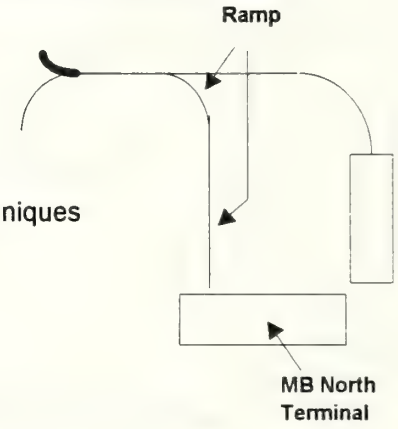
ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 2.6 Construct At-Grade Crossing South of Harrison Street, Demolish old 2nd Street Ramp

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.

Construct At-Grade Crossing South of Harrison Street

(unit cost to be applied $7.00/sf from P.B. estimate)

# of segments	Length	Width	Area	
	ft	ft	ft^2	
2	300	22	6,600	
			6,600	ft^2

TOTAL NEW CONCRETE THIS PAGE =	6,600 SF

P.B.'s estimate indicates a unit cost of $7.00/sf of at grade paving. However, since said ramps must match aerial ramps at ramp interface increase by $18/sf. **SAY $25/SF**

Demolish old Ramps: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length	Width	Depth	1.5 Bulk	Ft^3	Yd^3
	ft	ft	ft	1.5		
	50	30	4.5	1.5	10,125	375 CY

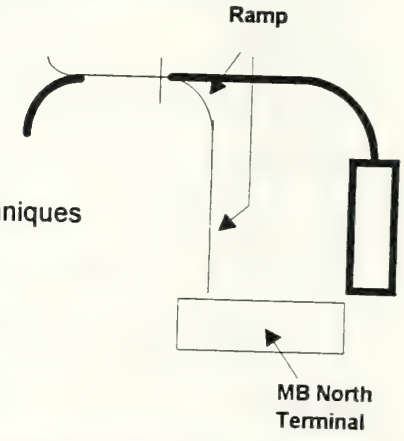
ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR PRIMARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL

Stage 3.0 Open New Ramp and Terminal Demolish Transbay Terminal and Remaining Ramp

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing cclumn dimensions.
3. Scaling from 1"=100' scale orthophoto.
4. Information from ICF Kaiser TBT Demolition estimate

Demolish Ramp Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	520	30	4.5	1.5	105,300	3,900
T.B.T. Approach	460	120	4.5	1.5	372,600	13,800
T.B.T. Approach	600	40	4.5	1.5	162,000	6,000
						23,700 CY

Demolish Ramp Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
8	30	25	1.5	9000	333 CY
21	30	25	1.5	23625	875 CY
50	30	4.91	1.5	11047.5	409 CY
					1,618 CY

Demolish Ramp Bent Cap:

Bent cap volume = approx. = 30% column — 485 CY

Demolish Ramp Foundation:

Foundation volume assumed to be = approx. same volume as column — 1,618 CY

TOTAL CONCRETE RAMP DEMO. THIS PAGE = 27,420 CY

Trans Bay Terminal Demolition: (See attached ICF KE TBT Demolition Estimate)

CONCRETE DEMOLITION	15,700 CY
STEEL DEMOLITION, OFF-HAUL & SALVAGE	3,600 TONS
ROOFING DEMOLITION & OFF-HAUL	26,000 CY
TRAFFIC CONTROL	1 LS
INTERIOR, MECHANICAL & ELECTRICAL	1 LS

ATTACHMENT 1

Main/Beale North Summary

Parsons Brinckerhoff Construction Services, Inc.
Project: Transbay Terminal
Client: City of San Francisco
Date : 17-Oct-95

Re: Main/Beale Terminal - (Option MB North)

	DESCRIPTION		TOTAL (1995$)
1	Foundation - TBT (Partial)		$3,245,074
2	Structure		$18,237,918
3	Architectural		$12,554,697
4	Vertical Circulation		$6,400,000
5	Mechanical, Electrical, & Fire Protection		$8,976,275
6	Grade Level Elements @ 50% (Shared w/JPB)		$2,230,000
	SUBTOTAL TRANSBAY - MAIN/BEALE NORTH		**$51,643,963**
	CONTINGENCY	**25%**	$12,910,991
	ENGINEERING & ADMINISTRATION	**25%**	$16,138,738
	PROJECT RESERVE	**8%**	$6,455,495
	TOTAL TRANSBAY - M/B NORTH		**$87,149,187**

Possible Additives:
(Following costs include Contingencies, Eng. & Admin., and Project Reserve Costs)

1	Demolition - Existing Bus Ramps	$6,632,930
2	New Bus Ramps	$39,746,987
3	Street and Roadway Modifications	$575,049
4	Demolition - Existing TBT (Incl. Backfill)	$10,125,000
5	Additional Fdn./Arch. - TBT (if CalTrain is not extended under Beale)	$6,886,527
6	Grade Level Elements @ 50% (JPB's Share)	$3,763,125
* 7	Grade Level Elements Upgrades (Muni/SamTrans Drop-off to Retail)	$4,211,409
	TOTAL	$159,090,215

Assumptions/Qualifications:

1.) Possible Real Estate Acquisition is *not included*
2.) Seismic Upgrade of existing structures is *not included*
3.) Train Level and foundation costs are *not included*
4.) Minor Street Improvements *are included* (New Folsom Street is not included)
5.) Temporary Bus Facility *is not included*
6.) Muni/SamTrans Surface Bus Terminal *is included*
7.) Van Pool Storage *is included*
8.) Tenant finish-out is *not included*
9.) Joint Plaza development of 30,000 sf at main entrance *is included ($2.53m w/markups)*
* 10.) Muni/SamTrans Drop-off conversion to retail space is prorated at 80/20 retail/common area
11.) Minor Hazardous Material disposal *is included*
12.) Engineering & Administration Costs includes Design, Construction Mgt., and Agency Administration Costs

ATTACHMENT #3

Transbay Main/Beale North

5	Weather protection canopies	(81,600)	$35.00	SF	($2,856,000)
6	Benches	(300)	$200.00	LF	($60,000)
7	CCTV, public address, card access, etc.	(408,800)	$7.00	SF	($2,861,600)
8	Plaza Area	(30,000)	$50.00	SF	($1,500,000)
9	Pedestrian Crosswalks	(25,200)	$20.00	SF	($504,000)
10	Pedestrian Signaling	(14)	$25,000	EA	($350,000)
11	Bus Drop-off	(33,600)	$7.00	SF	($235,200)

Subtotal Minus Non-Shared Items **$ (12,555,675)**

Subtotal Plus Original (Shared Amount): **$ 17,014,697**

Subtotal Shared Amount To be Split **$ 4,459,022**

Total Shared Amount @ 50% **$ 2,229,511**

TOTAL MB - NORTH **$51,643,474**

Possible Additives:

(Following costs include Contingencies, Eng. & Admin., and Project Reserve Costs)

Demolition - Existing Bus Ramps					$3,930,625
	Inbound/Outbound for Buses	47,000	SF	$16.88	$793,125
	Traffic Off-Ramp	51,000	SF	$12.50	$637,500
	Inbound Viaduct	130,000	SF	$12.50	$1,625,000
	Outbound Viaduct	70,000	SF	$12.50	$875,000
New Bus Ramps					$23,313,000
1	Bus Off-Ramp Viaduct	21,400	SF	$120.00	$2,568,000
2	A.C. Transit Storage	98,000	SF	$120.00	$11,760,000
3	Traffic Off-Ramp	38,000	SF	$120.00	by others
4	Approach Viaduct	74,875	SF	$120.00	$8,985,000
Street and Roadway Modifications					$340,770
	A.C. Transit Bus Pavement to Storage Are	20,110	SF	$7.00	$140,770
	Traffic Signal Mod. @ 2nd for A.C. Transit	1	LS	$100,000.00	$100,000
	Traffic Signal Mod. @ Folsom/	1	LS	$100,000.00	$100,000
Demolition - Existing TBT (Incl. Backfill)					$5,999,775
1	Roof	101,500	SF	$4	$406,000
2	Train Level	101,500	SF	$20	$2,030,000
3	Structural Slabs	203,000	SF	$10	$2,030,000
4	Slab-On-Grade	101,500	SF	$4	$406,000
5	Backfill	45,111	CY	$25	$1,127,775

Fdn/Arch. - TBT (If CalTrain is not included) ~~$4,080,905~~

Grade Level Elements @ 50% (JPB's Share) $ 2,229,511

SEE STAGE 2.0
NEW MB NORTH TRANSIT TERMINAL

EXCERPT FROM PARSONS BRINCKERHOFF ESTIMATE

~~**TOTAL OF $4,080,905 ADDED TO TERMINAL COST, FOR FDN/ARCH. TBT (IF CALTRAIN IS NOT INCLUDED).**~~

TOTAL OF $4,459,022 ADDED TO TERMINAL COST, FOR GRADE LEVEL ELEMENTS (APPLY FULL AMOUNT $2,229,511*2=$4,459,022)

ATTACHMENT #4

Parsons Brinckerhoff Construction Services, Inc.

Project: Transbay Terminal
Client: City of San Francisco
Date: 26-Jan-96

Re: Main/Beale Terminal - (Option MB North)
(Additional Foundation/Arch. @ SamTrans Layover Area)

	Description	Qty.	Units	Unit Price	Subtotal	Total (1995$)
Foundation - TBT (Partial):						
1	Foundation - SamTrans Layover					$0
	Piles & Cap					
	Excavation/Disposal (Haz. Waste)	0	CY	$121.00	$0	
	Subbase	0	CY	$20.00	$0	
	Concrete	0	CY	$225.00	$0	
	Reinforcement	0	LBS	$0.70	$0	
	Piles - 16" dia.	0	LF	$75.00	$0	
		Subtotal	Foundation - TBT (Partial):			$0
Structure:						
1	Structural Steel					$0
	Structural Steel (Wgts. > 40#/LF)	0	LBS	$1.08	$0	
	Mtl. Decking 3" - 20ga.	0	SF	$3.16	$0	
2	Lightweight Concrete	0	CY	$250.00		$0
3	6 x 6 - w2.0 x w2.0 Mesh (+10%)	0	SF	$0.60		$0
4	Waterproofing	0	SF	$2.00		$0
5	Miscellaneous Metals (Wgts. < 40#/LF)	60,000	LBS	$2.00		$120,000
6	Spandrel Beam Exterior	400	SF	$25.00		$10,000
		Subtotal	Structure:			$130,000
Arch. (w/add'l Retail @ Muni/SamTrans Drop-off Area:						
1	Architectural	1	LS	$1,586,900		$1,586,900
		Subtotal	Arch. (w/add'l Retail @ Muni/SamTrans Dro			$1,586,900
Vertical Circulation:						
1	Vertical Circulation	1	LS	$105,000		$105,000
		Subtotal	Vertical Circulation:			$105,000
Mechanical, Electrical, & Fire Protection :						
1	Fire Protection	35,000	SF	$6.00		$210,000
2	Plumbing	35,000	SF	$4.00		$140,000
3	Ventilation	35,000	SF	$2.75		$96,250
4	Electrical	35,000	SF	$6.50		$227,500
		Subtotal	Mechanical, Electrical, & Fire Protection :			$673,750
Temporary Bus Terminal :						
1	Temporary Bus Terminal	1	LS	n/a		$0
TOTAL	Grade Level Elements Upgrades (Muni/SamTrans Drop-off to Retail)					$ 2,495,650
				CONTINGENCY	25%	$623,913
				MANAGEMENT ADD-ON ALLOWANCE	25%	$779,891
				PROJECT RESERVE	8%	$311,956
					TOTAL	$4,211,409

SEE STAGE 2.0
NEW MB NORTH TRANSIT TERMINAL

EXCERPT FROM PARSONS BRINCKERHOFF ESTIMATE

TOTAL OF $2,495,650 ADDED TO TERMINAL COST, FOR GRADE LEVEL ELEMENT UPGRADES (MUNI/SAM TRANS DROP-OFF TO RETAIL.

5	Weather protection canopies	(81,600)	$35.00	SF	($2,856,000)
6	Benches	(300)	$200.00	LF	($60,000)
7	CCTV, public address, card access, etc.	(408,800)	$7.00	SF	($2,861,600)
8	Plaza Area	(30,000)	$50.00	SF	($1,500,000)
9	Pedestrian Crosswalks	(25,200)	$20.00	SF	($504,000)
10	Pedestrian Signaling	(14)	$25,000	EA	($350,000)
11	Bus Drop-off	(33,600)	$7.00	SF	($235,200)

Subtotal Minus Non-Shared Items **$ (12,555,675)**

Subtotal Plus Original (Shared Amount): **$ 17,014,697**

Subtotal Shared Amount To be Split **$ 4,459,022**

Total Shared Amount @ 50% **$ 2,229,511**

TOTAL MB - NORTH **$51,643,474**

Possible Additives:

(Following costs include Contingencies, Eng. & Admin., and Project Reserve Costs)

Demolition - Existing Bus Ramps					$3,930,625
	Inbound/Outbound for Buses	47,000	SF	$16.88	$793,125
	Traffic Off-Ramp	51,000	SF	$12.50	$637,500
	Inbound Viaduct	130,000	SF	$12.50	$1,625,000
	Outbound Viaduct	70,000	SF	$12.50	$875,000
New Bus Ramps					$23,313,000
1	Bus Off-Ramp Viaduct	21,400	SF	$120.00	$2,568,000
2	A.C. Transit Storage	98,000	SF	$120.00	$11,760,000
3	Traffic Off-Ramp	38,000	SF	$120.00	by others
4	Approach Viaduct	74,875	SF	$120.00	$8,985,000
Street and Roadway Modifications					$340,770
	A.C. Transit Bus Pavement to Storage Are	20,110	SF	$7.00	$140,770
	Traffic Signal Mod. @ 2nd for A.C. Transit	1	LS	$100,000.00	$100,000
	Traffic Signal Mod. @ Folsom/	1	LS	$100,000.00	$100,000
Demolition - Existing TBT (Incl. Backfill)					$5,999,775
1	Roof	101,500	SF	$4	$406,000
2	Train Level	101,500	SF	$20	$2,030,000
3	Structural Slabs	203,000	SF	$10	$2,030,000
4	Slab-On-Grade	101,500	SF	$4	$406,000
5	Backfill	45,111	CY	$25	$1,127,775

Fdn/Arch. - TBT (If CalTrain is not included) $4,080,905

Grade Level Elements @ 50% (JPB's Share) **$ 2,229,511**

@ 100%

Possible Additives: **$ 39,894,586**

TOTAL **$91,538,060**

SEE STAGE 2.0, 2.2, 2.3, 2.5
NEW RAMP CONSTRUCTION

EXCERPT FROM PARSONS BRINCKERHOFF ESTIMATE

UNIT COST FOR RAMP CONSTRUCTION = $120/SF

6	Weather protection canopies	(81,600)	$35.00	SF	($2,856,000)
6	Benches	(300)	$200.00	LF	($60,000)
7	CCTV, public address, card access, etc.	(408,800)	$7.00	SF	($2,861,600)
8	Plaza Area	(30,000)	$50.00	SF	($1,500,000)
9	Pedestrian Crosswalks	(25,200)	$20.00	SF	($504,000)
10	Pedestrian Signaling	(14)	$25,000	EA	($350,000)
11	Bus Drop-off	(33,600)	$7.00	SF	($235,200)

Subtotal Minus Non-Shared Items **$ (12,565,675)**

Subtotal Plus Original (Shared Amount): **$ 17,014,697**

Subtotal Shared Amount To be Split **$ 4,459,022**

Total Shared Amount @ 50% **$ 2,229,511**

TOTAL MB - NORTH **$51,643,474**

Possible Additives:

(Following costs include Contingencies, Eng. & Admin., and Project Reserve Costs)

Demolition - Existing Bus Ramps					**$3,930,625**
	Inbound/Outbound for Buses	47,000 SF	$16.88	$793,125	
	Traffic Off-Ramp	51,000 SF	$12.50	$637,500	
	Inbound Viaduct	130,000 SF	$12.50	$1,625,000	
	Outbound Viaduct	70,000 SF	$12.50	$875,000	
New Bus Ramps					**$23,313,000**
1	Bus Off-Ramp Viaduct	21,400 SF	$120.00	$2,568,000	
2	A.C. Transit Storage	98,000 SF	$120.00	$11,760,000	
3	Traffic Off-Ramp	38,000 SF	$120.00	by others	
4	Approach Viaduct	74,875 SF	$120.00	$8,985,000	
Street and Roadway Modifications					**$340,770**
	A.C. Transit Bus Pavement to Storage Are	20,110 SF	$7.00	$140,770	
	Traffic Signal Mod. @ 2nd for A.C. Transit	1 LS	$100,000.00	$100,000	
	Traffic Signal Mod. @ Folsom/	1 LS	$100,000.00	$100,000	
Demolition - Existing TBT (Incl. Backfill)					**$5,999,775**
1	Roof	101,500 SF	$4	$406,000	
2	Train Level	101,500 SF	$20	$2,030,000	
3	Structural Slabs	203,000 SF	$10	$2,030,000	
4	Slab-On-Grade	101,500 SF	$4	$406,000	
5	Backfill	45,111 CY	$25	$1,127,775	

Fdn/Arch. - TBT (If CalTrain is not included) **$4,060,905**

Grade Level Elements @ 50% (JPB's Share) **$ 2,229,511**

100%

Possible Additives: **$ 39,894,586**

TOTAL **$91,538,060**

SEE STAGE 1.0, 3.0
NEW TEMPORARY BUS STORAGE
TRAFFIC SIGNAL MODIFICATIONS

EXCERPT FROM PARSONS BRINCKERHOFF ESTIMATE

UNIT COST FOR TEMPORARY BUS STORAGE = $7/SF
UNIT COST FOR TRAFFIC SIGNAL MODIFICATION = $100,000 EACH

ICF KAISER ENGINEERS, INC.
SAN FRANCISCO, CALIFORNIA
JOB NO. 65928-005-05

ICF KAISER ENGINEERS INTERACTIVE ESTIMATING
CALTRAIN DOWNTOWN EXTENSION

REPORT D1 - ESTIMATE DETAIL BY FACILITY

DATE: 05/07/96 15:06
BY BCC/RLM/HWH

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
115			DEMOLITION - TRANSBAY TERMINAL									
115		.0214810.	TRAFFIC CONTROL	1 LS	5000	0	0	0	250000	0	12500	262500
115		.0214811.	CONCRETE DEMOLITION	15700 CY	22451	0	0	0	1193200	0	59660	1252860
115		.0214812:	HAUL CONCRETE TO GRINDING & RECYCLING PLANT	15700 CY	0	0	0	0	204100	0	10205	214305
115		.0214815.	STRUCT STEEL DISMANTLING	3600 TN	13500	0	0	0	846000	0	42300	888300
115		.0214816.	HAUL STEEL TO SALVAGE YARD	3600 TN	0	0	0	0	14400	0	720	15120
115		.0214817.	STEEL SALVAGE VALUE	3600 TN	0	0	0	0	-108000	0	-5400	-113400
115		.0214821.	ROOFING & SIDING DEMOLITION	233700 SF	4674	0	0	0	219678	0	10984	230662
115		.0214822.	HAUL ROOFING & SIDING TO COLMA DUMP (INCL FEE)	26000 CY	0	0	0	0	780000	0	39000	819000
115		.0214824.	REMOVE & HAUL OFF INTERIOR WALLS & PARTITIONS	1 LS	3500	0	0	0	500000	0	25000	525000
115		.0214825.	REMOVE & HAUL OFF PIPING & ELECTRICS	1 LS	2000	0	0	0	285000	0	14250	299250
	TOTAL		DEMOLITION - TRANSBAY TERMINAL		51,125	0	0	0	4,184,378	0	209,219	4,393,597
REPORT TOTAL					51,125	0	0	0	4,184,378	0	209,219	4,393,597

SEE STAGE 3.0
DEMOLITION OF TRANS BAY TERMINAL
$4,393,597 IS AN EXCERPT FROM ICF KAISER ESTIMATE

TOTAL OF :

- **$262,500 FOR TRAFFIC CONTROL**
- **($1,252,860+$214,305)/15,700CY = $93.45/CY FOR CONCRETE DEMOLITION AND OFF-HAUL.**
- **($888,300+$15,120-113,400)/3,600 TN = $219/TON FOR STEEL DEMOLITION, OFF-HAUL AND SALVAGE.**
- **($230,662+819,000)/26,000 CY = $40.37/CY FOR ROOFING AND SIDING DEMOLITION AND OFF-HAUL TO DUMP**
- **($525,000+$299,250 = $824,250 FOR REMOVE & OFF-HAUL INTERIOR WALL & PARTITIONS, AND REMOVE & OFF-HAUL PIPING & ELECTRICAL.**

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
376			TEMPORARY BUS PARKING									
376		.0000031.	ALT MB NORTH - OPTION A TEMPORARY BUS PARKING 44 SPACES	1 LS	0	0	0	0	0	0	0	0
376		.0214108.	CLEAR DEBRIS ON RAMP	1 LS	24	0	0	0	1600	0	80	1680
376		.0220241.	HAUL TO DUMP - EXCAV MAT'L	15900 CY	1590	58862	64459	0	47303	0	51694	222318
376		.0220242.	DUMP FEE	15900 CY	0	0	0	0	190800	0	9540	200340
376		.0220338.	EXCAVATE & LOAD STOCKPILED EARTH	15775 CY	1262	50764	15318	0	0	0	26433	92515
376		.0225001.	PREPARE SUBGRADE	5910 SY	65	2791	1501	0	0	0	1717	6009
376		.0268005.	STORM DRAINAGE	1 LS	200	0	0	0	25000	0	1250	26250
376		.0271128.	FENCE, 8' HIGH, CHAIN LINK W/ BARBED WIRE	940 LF	193	6862	820	7139	0	0	3787	18608
376		.0271148.	FENCE GATE, VEHICLE 8' CHAIN LINK	80 LF	42	1493	180	3298	0	0	999	5970
376		.0282456.	AC PAVING INCL AGG BASE	5910 SY	520	0	0	0	265950	0	13298	279248
376		.0287374.	PARKING BUMPERS	44 EA	15	0	0	0	1540	0	77	1617
376		.0289814.	STRIPING - 4" WIDE	1750 LF	21	690	177	228	0	0	370	1465
376		.1573251.	FIRE PROTECTION	53200 SF	319	0	0	0	53200	0	2660	55860
376		.1610010.	YARD LIGHTING	53200 SF	0	0	0	0	18620	0	931	19551
	TOTAL		TEMPORARY BUS PARKING		4,251	121,462	82,455	10,665	604,013	0	112,836	931,431
REPORT TOTAL					4,251	121,462	82,455	10,665	604,013	0	112,836	931,431

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

06/09/96 12:25:42
BY BCC
REV No. D

SEGMENT: MBBASE - MB NORTH - BASEMENT PARK ADD'L

DESCRIPTION	UNIT	QTY	UNIT COST	FACTOR	TOTAL ($000)
SYSTEM DATA					
ROUTE LENGTH	RF			1.00	
TRACK LENGTH	TF			1.00	
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			1.00	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	821000	1.00	821
-STREET AND ROAD MODIFICATIONS	RF	1.0	640770	0.50	320
-RAILROAD MODIFICATIONS	LS			1.00	
-STRUCTURE MODIFICATIONS	LS			1.00	
-UNDERPINNING	LS			1.00	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2564153	1.00	2564
TRACKWAY - AERIAL	RF			1.00	
TRACKWAY - AT GRADE	RF				
TRACKWAY - RETAINED CUT	RF			1.00	
SUBWAY:	RF				
-CUT AND COVER (SPIC WALLS), 2-TRACK	RF			1.00	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			1.00	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			1.00	
-MINED TUNNEL	RF			1.00	
TERMINAL - STRUCT/FINISH	EA	1.0	18422000	1.00	18422
TRACKWORK - BALLASTED	TF			1.00	
TRACKWORK - DIRECT FIXATION	TF			1.00	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			1.00	
TRACTION POWER SYSTEM (SYS WIDE)	EA			1.00	
SIGNALING - WAYSIDE AND STATION	LS			1.00	
COMMUNICATIONS (SYSTEM WIDE)	TF			1.00	
YARDS & SHOPS (SYSTEM WIDE)	EA			1.00	
GALLERY CARS (SYSTEMWIDE)	EA			1.00	
LOCOMOTIVES (SYSTEMWIDE)	EA			1.00	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			1.00	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			1.00	
Subtotal CONSTRUCTION COSTS :					$22127
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			1.00	
ENGINEERING & MANAGEMENT				1.00	5532
Subtotal NON-CONSTRUCTION COSTS :					$5532
CONTINGENCY					
CONTINGENCY				1.00	5733
ESCALATION					
ESCALATION (NOT INCLUDED)				1.00	
PROJECT RESERVE					
PROJECT RESERVE				1.00	2671
TOTAL :					$36063

Caltrain SF Downtown Station EIS/EIR
Screening Estimate - Utilities
Segment MBN

Prepared by AGS, Inc.
6/7/96

SEGMENT MBN: Main - Beale North Bus Terminal

Howard St.: Main to Beale: cut/cover

UTILITY	NO.	ITEM	DISPOSITION	LIMITS	QUANTITY	UNIT COST	COST	TOTALS
Sewer	1.	3' X 5' brick	replace/support	Main to Beale	330	500	165,000	
							Sewer Subtotal	165,000
Potable Water	1.	8" pipe	replace	Main to Beale	330	150	49,500	
							Potable Water Subtotal	49,500
Auxiliary Water	1.	14" pipe	replace	Main to Beale	330	250	82,500	
	2.	8" lateral to hydrant	relocate	Howard	4	150	600	
							Auxiliary Water Subtotal	83,100
Gas	1.	3" PL pipe	relocate	Main to Beale	330	200	66,000	
							Gas Subtotal	66,000
Electrical	1.	Small RC box	replace		2	20000	40,000	
	2.	Medium RC box	replace		2	100000	200,000	
	3.	Active conduit (3"/6")	support in place	Main to Beale	5500	20	110,000	
	4.	Trench (18" X 40")	relocate	Main to Beale	350	40	14,000	
	5.	Streetlight	replace	Main to Beale	8	3800	30,400	
							Electrical Subtotal	394,400
Communications	3.	Small RC boxes	replace	Main to Beale	2	5000	10,000	
	4.	Medium RC box	replace	Main to Beale	1	20000	20,000	
	5.	Conduit (2"/4")	relocate	Main to Beale	1300	10	13,000	
	6.	Trench	relocate	Main to Beale	500	40	20,000	
							Communications Subtotal	63,000
							Segment MBN Total	**821,000**

AGS, INC. 4157774874 06/07/1996 14:18

WORK BREAKDWN FACIL.STANDRD	DESCRIPTION	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
901	BUS TERMINAL MBN - BASEMENT PARKING								
901 .00	FACILITY DESCRIPTION ONLY	0	0	0	0	0	0	0	0
901 .02	SITEWORK	49260	1212214	667790	195232	4556996	0	999376	7631608
901 .03	CONCRETE	152493	6454925	703375	4960260	0	0	3029641	15148201
901 .05	METALS	115	0	0	0	19200	0	960	20160
901 .07	THERMAL & MOISTURE PROTECTION	8945	293754	5546	254085	0	0	138346	691731
901 .09	FINISHES	0	0	0	0	52000	0	2600	54600
901 .15	MECHANICAL	18900	0	0	0	1561600	0	78080	1639680
901 .16	ELECTRICAL	2250	0	0	0	225000	0	11250	236250
TOTAL	BUS TERMINAL MBN - BASEMENT PARKING	231,963	7,960,893	1,376,711	5,409,577	6,414,796	0	4,260,253	25,422,230
REPORT TOTAL		231,963	7,960,893	1,376,711	5,409,577	6,414,796	0	4,260,253	25,422,230

LESS FOUNDATION W/ NO BASEMENT (SEE STAGE 2) 7,000,000

ADDITIONAL COST FOR BASEMENT (FACILITY COST) $18,422,000

REPORT D1 - ESTIMATE DETAIL BY FACILITY

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
901	BUS TERMINAL ALT MB NORTH - PARKING									
901 .00	FACILITY DESCRIPTION ONLY									
901 .0000004.	SUBSURFACE PARKING 600' X 250' X 14' DEEP 412 SPACES	1 EA	0	0	0	0	0	0	0	0
TOTAL	FACILITY DESCRIPTION ONLY		0		0		0		0	
				0		0		0		0
901 .02	SITEWORK									
901 .0214632.	REMOVE CONCRETE GUIDE WALLS	3448 LF	0	0	0	0	313458	0	15673	329131
901 .0214634.	REMOVE TOP OF SOIL CEMENT WALL	1535 CY	0	0	0	0	97687	0	4884	102571
901 .0214702.	FRAME & FINISH OPENING TO TRANSBAY TERMINAL SUBWAY STATION	1 LS	960	0	0	0	50000	0	2500	52500
901 .0220228.	3' THICK SOIL CEMENT WALL. WITH SOLDIER PILES INCLUDED (W 24 X 94 H - PILES) > 75'	103440 SF	13447	0	0	0	2275680	0	113784	2389464
901 .0220241.	HAUL TO DUMP - EXCAV MAT'L	88700 CY	8870	328367	359590	0	263883	0	288377	1240217
901 .0220242.	DUMP FEE	88700 CY	0	0	0	0	1064400	0	53220	1117620
901 .0220332.	COMPACTED FILL	16700 CY	5043	178414	27288	194060	0	0	101687	501449
901 .0221120.	EXCAV MASS-2CY CLAMSHELL	117500 CY	15275	701886	280003	0	0	0	392756	1374645
901 .0233812.	12" X 12" PRECAST PILE	28000 LF	5320	0	0	0	470680	0	23534	494214
901 .0287361.	6" CONC SIDEWALK	1320 SF	71	0	0	0	5438	0	272	5710
901 .0287374.	PARKING BUMPERS	412 EA	136	0	0	0	14420	0	721	15141
901 .0289814.	STRIPING - 4" WIDE	9000 LF	108	3547	909	1172	0	0	1900	7528
901 .0289817.	DIRECTIONAL ARROWS ON FLOOR	30 EA	30	0	0	0	1350	0	68	1418
TOTAL	SITEWORK		49,260		667,790		4,556,996		999,376	
				1,212,214		195,232		0		7,631,608
901 .03	CONCRETE									
901 .0310100.	FORMS - GENERAL	272100 SF	57141	2561441	54692	262753	0	0	719722	3598608
901 .0313206.	NEOPRENE WATERSTOPS,DB, 6"	1700 LF	153	6858	146	9569	0	0	4143	20716
901 .0314101.	CONCRETE - PILE CAP	560 CY	840	30682	996	41317	0	0	18249	91244
901 .0332309.	REBAR - GENERAL	8443000 LB	67544	2854016	491129	2381770	0	0	1431729	7158644
901 .0334300.	CONCRETE - SLAB ON GRADE	16670 CY	8335	311937	51410	1157565	0	0	380228	1901140
901 .0334303.	CONCRETE - ENTRANCE & EXIT RAMP	195 CY	146	5464	902	14387	0	0	5188	25941
901 .0344830.	CONCRETE - SUPPORTED SLAB AND BEAMS	12735 CY	12735	476607	78562	884318	0	0	359872	1799359
901 .0354202.	CONCRETE - GRADE BEAM	860 CY	1806	65967	2141	63451	0	0	32890	164449
901 .0354400.	CONCRETE - EXTERIOR WALLS	1775 CY	3106	116242	19161	123256	0	0	64665	323324
901 .0364103.	CONCRETE (4000 PSI) - COLUMNS	315 CY	687	25711	4236	21874	0	0	12955	64776

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG		DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
	TOTAL	CONCRETE		152,493		703,375		0		3,029,641	
					6,454,925		4,960,260		0		15,148,201
901 .05		METALS									
901 .0554153.		EMERG SECURITY ROLL-DOWN GATE W/MAN DOOR	480 SF	115	0	0	0	19200	0	960	20160
	TOTAL	METALS		115		0		19,200		960	
					0		0		0		20,160
901 .07		THERMAL & MOISTURE PROTECTION									
901 .0711020.		WATER PROOFING MEMBRANE	178900 SF	8945	293754	5546	254085	0	0	138346	691731
	TOTAL	THERMAL & MOISTURE PROTECTION		8,945		5,546		0		138,346	
					293,754		254,085		0		691,731
901 .09		FINISHES									
901 .0955353.		CONCRETE STAIRS	2 EA	0	0	0	0	52000	0	2600	54600
	TOTAL	FINISHES		0		0		52,000		2,600	
					0		0		0		54,600
901 .15		MECHANICAL									
901 .1571111.		HVAC	150000 SF	18000	0	0	0	975000	0	48750	1023750
901 .1573251.		FIRE PROTECTION	150000 SF	900	0	0	0	150000	0	7500	157500
901 .1575100.		ELEVATOR	2 EA	0	0	0	0	166600	0	8330	174930
901 .1575205.		ESCALATORS	2 EA	0	0	0	0	270000	0	13500	283500
	TOTAL	MECHANICAL		18,900		0		1,561,600		78,080	
					0		0		0		1,639,680
901 .16		ELECTRICAL									
901 .1634351.		LIGHTING	150000 SF	2250	0	0	0	225000	0	11250	236250
	TOTAL	ELECTRICAL		2,250		0		225,000		11,250	
					0		0		0		236,250
	TOTAL	BUS TERMINAL ALT MB NORTH - PARKING		231,963		1,376,711		6,414,796		4,260,253	
					7,960,893		5,409,577		0		25,422,230
REPORT TOTAL				231,963		1,376,711		6,414,796		4,260,253	
					7,960,893		5,409,577		0		25,422,230

ICF KAISER ENGINEERS
CalTrain Downtown Extension
JOB NO. 65928-005-06

06/10/96 10:07:16
BY BCC
REV No. D

SEGMENT: MBBASE - MB NORTH - BASEMENT PARK ADD'L

DESCRIPTION	UNIT	QTY	TOTAL	CONT. %	CONTIN-GENCY
SYSTEM DATA					
ROUTE LENGTH	RF				
TRACK LENGTH	TF				
CONSTRUCTION COSTS					
SITE MODIFICATIONS:					
-DEMOLITION	RF			30.0	
-UTILITY RELOCATIONS/MODIFICATIONS	RF	1.0	821	25.0	205
-STREET AND ROAD MODIFICATIONS	RF	1.0	320	30.0	96
-RAILROAD MODIFICATIONS	LS			30.0	
-STRUCTURE MODIFICATIONS	LS			30.0	
-UNDERPINNING	LS			25.0	
-ENVIRONMENTAL MITIGATIONS	LS	1.0	2564	25.0	641
TRACKWAY - AERIAL	RF			20.0	
TRACKWAY - AT GRADE	RF			30.0	
TRACKWAY - RETAINED CUT	RF			20.0	
SUBWAY:	RF				
-CUT AND COVER (SPTC WALLS), 2-TRACK	RF			20.0	
-CUT AND COVER (SOIL-CEMENT WALLS)	RF			20.0	
-CUT AND COVER (MESH/ROCK BOLTS)	RF			20.0	
-MINED TUNNEL	RF			20.0	
TERMINAL - STRUCT/FINISH	EA	1.0	18422	20.0	3684
TRACKWORK - BALLASTED	TF			15.0	
TRACKWORK - DIRECT FIXATION	TF			15.0	
SPECIAL TRACKWORK, TURNOUTS, ETC.	LS			15.0	
TRACTION POWER SYSTEM (SYS WIDE)	EA			20.0	
SIGNALING - WAYSIDE AND STATION	LS			25.0	
COMMUNICATIONS (SYSTEM WIDE)	TF			25.0	
YARDS & SHOPS (SYSTEM WIDE)	EA			25.0	
GALLERY CARS (SYSTEMWIDE)	EA			10.0	
LOCOMOTIVES (SYSTEMWIDE)	EA			10.0	
DIESEL LOCOMOTIVE REPLACEMENT CREDIT	EA			10.0	
PARK & RIDE LOTS & ACCESS IMPROVEMENTS	SP			30.0	
Subtotal CONSTRUCTION COSTS :			$22127		$4627
NON-CONSTRUCTION COSTS					
RIGHT OF WAY & RELOCATION	EA			25.0	
ENGINEERING & MANAGEMENT			5532	20.0	1106
Subtotal NON-CONSTRUCTION COSTS :			$5532		$1106
CONTINGENCY					
CONTINGENCY			5733		
ESCALATION					
ESCALATION (NOT INCLUDED)					
PROJECT RESERVE					
PROJECT RESERVE			2671		
Subtotal :			$36063		$5733

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT	CALC. NO. _____ REV _____
	SHEET _____ OF _____
	DESIGNED BY R. Moore DATE 5-16-96
BUS FACILITIES	CHECKED BY Rev. 3 K. Kalsi DATE 8/22/96

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE, MAIN-BEALE NORTH BUS TERMINAL (SURFACE)

QUANTITY AND UNIT COST SUMMARY

	Stage										Total Qty.	Units	Unit Cost	Total Cost	Comments
	0, 0.1, 1.0	1.1	2.0	2.1	2.2	2.3	2.4	2.5	2.6	3					
Concrete	0	43,721	0	9,092	0	0	6,392	0	375	27420	86,999	CY	$ 37.00	$ 3,218,978	See STage 0,0.1,1.0 sheet
Demolition	0	0	0	0	0	0	0	0	0	15700	15,700	CY	$ 93.45	$ 1,467,165	Unit cost per KE TBT Demo est.
Steel Demolition	0	1,150	0	0	0	0	0	0	0	3600	4,750	TN	$ 219.0	$ 1,040,250	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Roofing And Siding Demo.	0	0	0	0	0	0	0	0	0	26000	26,000	CY	$ 40.4	$ 1,049,620	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Demo. Misc. TBT material	0	0	0	0	0	0	0	0	0	1	1	LS	$ 824,250.0	$ 824,250	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Ramp Construction	0	0	60,000	0	20,800	3,840	0	15,400	0	0	100,040	SF	$ 120.0	$ 12,004,800	Dim. from aerial photo scale Unit cost per P.B. estimate
MB Term Construction	0	0	1	0	0	0	0	0	0	0	1	EACH	$ 13,912,692	$ 13,912,692	Unit cost from P.B. estimate
Temp/Perm. Bus Storage	1	0	1	0	0	0	0	0	0	0	2	LS	$ 931,431	$ 1,862,862	Dim. from aerial photo scale Unit cost per ICF KE estimate
Temp. Bus Turn Around	1	0	0	0	0	0	0	0	0	0	1	Allow	$ 300,000	$ 300,000	
2nd Street Approach	0	0	0	0	0	0	0	0	6,600	0	6,600	SF	$ 25	$ 165,000	Unit cost & count from P.B. estimate
Street & Road Modifications	0	0	1	0	0	0	0	0	0	0	1	Each	$ 640,770	$ 640,770	Unit cost & count from P.B. estimate
Utility Relocation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	Allow	$ 300,000	$ 300,000	
Traffic Control	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	LS	$ 262,500	$ 525,000	Dim & unit cost from KE TBT demo. estimate.

SUBTOTAL - MAIN-BEALE NORTH BUS TERMINAL SURFACE=		$ 37,311,387
RIGHT-OF-WAY=		$ 4,750,000
ENGINEERING & ADMINISTRATION =	25%	$ 9,327,847
CONTINGENCY =	25%	$ 11,659,820
PROJECT RESERVE =	8%	$ 4,663,928
TOTAL - MAIN-BEALE NORTH BUS TERMINAL =		$ 67,712,982

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

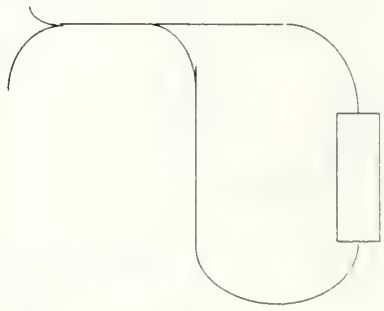
Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 0 Existing Condition
Stage 0.1 Caltrans Constructs New Fremont Street Off-Ramp

Stage 1.0 Modify Existing Bus Terminal

Modify Existing Terminal:



Temporary Storage for Buses: (See estimate by ICF KE)

Total =	$931,431

CALCULATION FOR UNIT COST OF RAMP DEMOLITION

Per phone conversation with P.B. rep (August 16, 1996), cost per square foot of concrete ramp demolition should be approximately $13.00/SF. Convert to cubic yard unit cost.

Ramp demolition area = 289,000 sf
Ramp demolition volume = 102,699 cy

($13.00/SF)*(289,000 SF / 102,699 CY)= $ 36.58 /CY

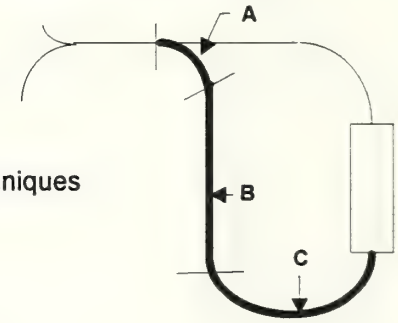
USE $37.00 / CY

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 1.1 Demolish Inbound Bus Loop and Fremont Street Off-Ramp Parallel to Folsom Street



Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.

Superstructure: (average depth = approx. 4.5' for concrete girders & 3' for steel girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
Area A =	350	80	4.5	1.5	189,000	7,000
Area B (bus) =	1000	30	4.5	1.5	202,500	7,500
Area B (vehicle)	620	30	4.5	1.5	125,550	4,650
Area C =	900	75	3	1.5	303,750	11,250
Total =						30,400 CY

Columns:

Concrete:

	Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
Area A =	18	30	25	1.5	20250	750
Area B =	83	30	25	1.5	93375	3,458
Area C =	38	30	25	1.5	42750	1,583
						5,792 CY

Bent Cap:

Bent cap volume = approx. = 30% column — 1,738 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column — 5,792 CY

TOTAL CONCRETE DEMO. THIS PAGE = 43,721 CY

Steel:

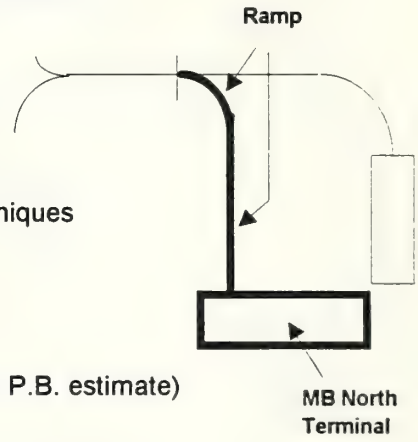
Girders supporting deck in area "C" = 1,150 Tons

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 2.0 Construct New Bus Terminal and Ramp, Construct Shoo-fly for Stage 2.1



Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.

New MB North access ramp: (unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	1200	40	48,000	
	200	60	12,000	
			60,000	ft^2

New MB North (aerial) Transit Terminal:

			For Backup, See Attachement Sheet
Terminal : (see P.B. estimate for cost breakdown)		$ 7,412,692	1
Additional roof structure (open air)	Say	$ 2,000,000	
Greyhound facility	Say	$ 2,000,000	
Muni/GGT/SamTrans pass-through facility	Say	$ 1,500,000	
Plus allowance for aerial pedestrian walkway (say $1,000,000)	Say	$ 1,000,000	
Total MB North Transit Terminal =		$ 13,912,692	

Street & Road Modifications: 1 (see P.B. estimate for cost breakdown)

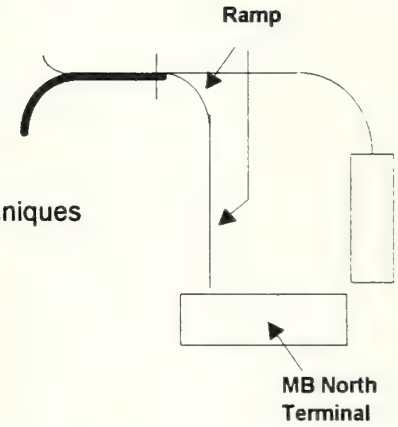
Per P.B. Estimate Street an Roadway Modifications =	$ 340,770
Includes 2 traffic signals	
Add $300,000 for misc. modifications =	$ 300,000
	$ 640,770

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 2.1 Demolish remaining Fremont street off-ramp parallel to Essex street



Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.

Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	1200	22	4.5	1.5	178,200	6,600 CY

Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
26	30	25	1.5	29250	1,083 CY

Bent Cap:

Bent cap volume = approx. = 30% column 325 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column 1,083 CY

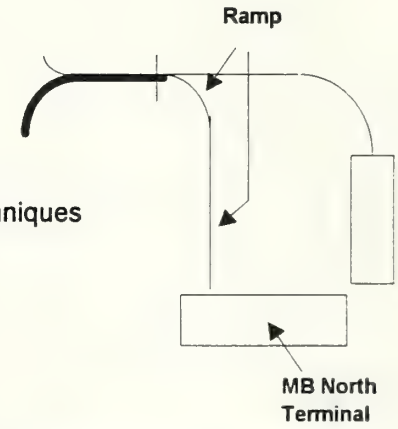
TOTAL CONCRETE DEMO. THIS PAGE = 9,092 CY

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 2.2 Construct East half of new bus ramp parallel to Essex St.



Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.

New bus ramp (part) parallel. to Essex: (unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	650	32	20,800	
			20,800	ft^2

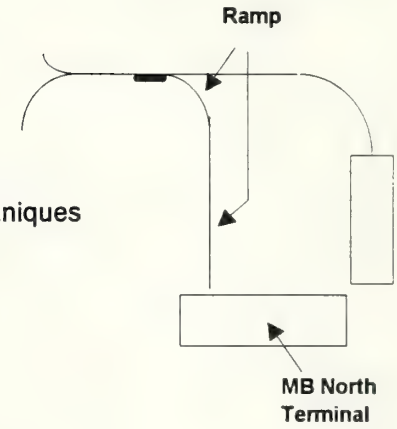
TOTAL NEW CONCRETE THIS PAGE =	20,800 SF

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 2.3 Construct East half of new bus ramp over Folsom Street



Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.

New bus ramp (part) parallel. to Essex over Folsom:
(unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	120	32	3,840	
			3,840	ft^2

TOTAL NEW CONCRETE THIS PAGE =	3,840 SF

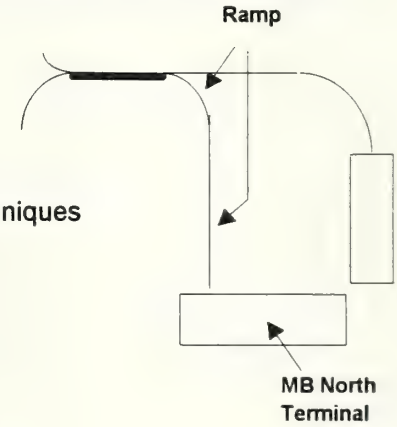
ICF KAISER	JOB NO. 65928-005-09
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 2.4 Demolish Existing Bus Ramp (Original Train Structure) Between Harrison and Folsom Street

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.

Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	750	30	4.5	1.5	151,875	5,625 CY

Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
16	15	25	1.5	9000	333 CY

Bent Cap:

Bent cap volume = approx. = 30% column 100 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column 333 CY

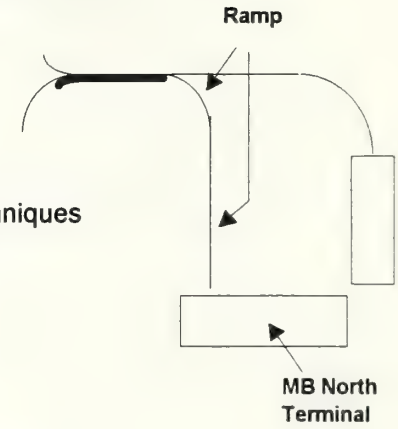
TOTAL CONCRETE DEMO. THIS PAGE = 6,392 CY

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 2.5 Construct West Half of New Bus Ramp Parallel to Essex Street



Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.

New bus ramp (part) West Half parallel. to Essex over Folsom:
(unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	1100	14	15,400	
			15,400	ft^2

TOTAL NEW CONCRETE THIS PAGE =	15,400 SF

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

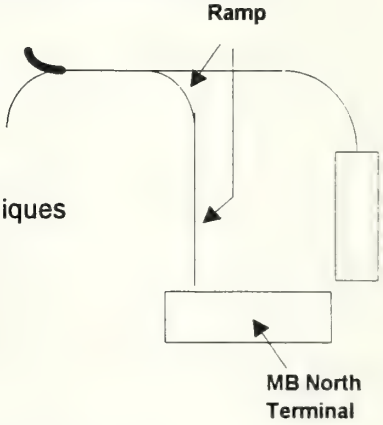
ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 2.6 Construct At-Grade Crossing South of Harrison Street, Demolish old 2nd Street Ramp

Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.



Construct At-Grade Crossing South of Harrison Street

(unit cost to be applied $7.00/sf from P.B. estimate)

# of segments	Length	Width	Area	
	ft	ft	ft^2	
2	300	22	6,600	
			6,600	ft^2

TOTAL NEW CONCRETE THIS PAGE =	6,600 SF

P.B.'s estimate indicates a unit cost of $7.00/sf of at grade paving. However, since said ramps must match aerial ramps at ramp interface increase by $18/sf. **SAY $25/SF**

Demolish old Ramps: (average depth = approx. 4.5' for concrete girders)

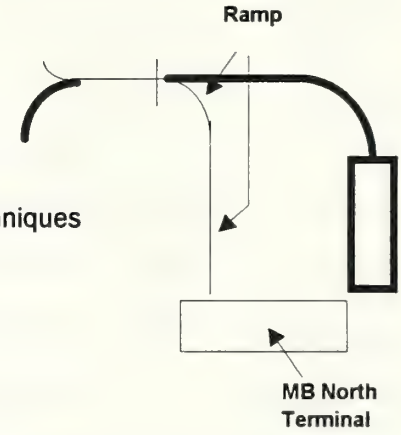
Concrete:	Length	Width	Depth	1.5 Bulk	Ft^3	Yd^3
	ft	ft	ft	1.5		
	50	30	4.5	1.5	10,125	375 CY

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-15-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE AERIAL MAIN-BEALE NORTH TERMINAL(SURFACE)

Stage 3.0 Open New Ramp and Terminal Demolish Transbay Terminal and Remaining Ramp



Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.
4. Information from ICF Kaiser TBT Demolition estimate

Demolish Ramp Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3	
	520	30	4.5	1.5	105,300	3,900	
T.B.T. Approach	460	120	4.5	1.5	372,600	13,800	
T.B.T. Approach	600	40	4.5	1.5	162,000	6,000	
						23,700	CY

Demolish Ramp Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3	
8	30	25	1.5	9000	333	CY
21	30	25	1.5	23625	875	CY
50	30	4.91	1.5	11047.5	409	CY
					1,618	CY

Demolish Ramp Bent Cap:

Bent cap volume = approx. = 30% column	485	CY

Demolish Ramp Foundation:

Foundation volume assumed to be = approx. same volume as column	1,618	CY
TOTAL CONCRETE RAMP DEMO. THIS PAGE =	27,420	CY

Trans Bay Terminal Demolition: (See attached ICF KE TBT Demolition Estimate)

CONCRETE DEMOLITION	15,700	CY
STEEL DEMOLITION, OFF-HAUL & SALVAGE	3,600	TONS
ROOFING DEMOLITION & OFF-HAUL	26,000	CY
TRAFFIC CONTROL	1	LS
INTERIOR, MECHANICAL & ELECTRICAL	1	LS

Main/Beale Surface Summary

Parsons Brinckerhoff Construction Services, Inc.
Project: Transbay Terminal
Client: City of San Francisco
Date : 17-Oct-95

Re: Main/Beale Terminal - (Option MB Surface)

DESCRIPTION			TOTAL (1995$)
1 Structure			$4,035,196
2 Architectural			$1,993,446
3 Vertical Circulation			$902,800
4 Mechanical, Electrical, & Fire Protection			$481,250
5 Temporary Bus Terminal			N/A
	SUBTOTAL MAIN/BEALE SURFACE		**$7,412,692**
	CONTINGENCY	**25%**	$1,853,173
	ENGINEERING & ADMINISTRATION	**25%**	$2,316,466
	PROJECT RESERVE	**8%**	$926,586
	TOTAL MAIN/BEALE SURFACE		**$12,508,917**

Possible Additives:
(Following costs include Contingencies, Eng. & Admin., and Project Reserve Costs)

1 Demolition - Existing Bus Ramps			$6,632,930
2 New Bus Ramps			$3,726,000
3 Street and Roadway Modifications			$2,832,503
4 Demolition - Existing TBT (Incl. Backfill)			$10,125,000
	TOTAL		$35,825,349

Assumptions/Qualifications:

1.) Possible Real Estate Acquisition is *not included*
2.) Seismic Upgrade of existing structures is *not included*
3.) Minor Street Improvements *are included* (New Folsom Street is not included)
4.) Temporary Bus Facility *is not included*
5.) Muni/SamTrans Surface Bus Terminal *is included*
6.) Van Pool Storage *is included*
7.) Tenant finish-out *is not included*
8.) Plaza development *is not included*

ICF KAISER ENGINEERS, INC.
SAN FRANCISCO, CALIFORNIA
JOB NO. 65928-005-05

ICF KAISER ENGINEERS INTERACTIVE ESTIMATING
CALTRAIN DOWNTOWN EXTENSION

REPORT D1 - ESTIMATE DETAIL BY FACILITY

DATE: 05/07/96 15:06
BY BCC/RLM/HWH

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
115	DEMOLITION - TRANSBAY TERMINAL									
115 .0214810.	TRAFFIC CONTROL	1 LS	5000	0	0	0	250000	0	12500	262500
115 .0214811.	CONCRETE DEMOLITION	15700 CY	22451	0	0	0	1193200	0	59660	1252860
115 .0214812:	HAUL CONCRETE TO GRINDING & RECYCLING PLANT	15700 CY	0	0	0	0	204100	0	10205	214305
115 .0214815.	STRUCT STEEL DISMANTLING	3600 TN	13500	0	0	0	846000	0	42300	888300
115 .0214816.	HAUL STEEL TO SALVAGE YARD	3600 TN	0	0	0	0	14400	0	720	15120
115 .0214817.	STEEL SALVAGE VALUE	3600 TN	0	0	0	0	-108000	0	-5400	-113400
115 .0214821.	ROOFING & SIDING DEMOLITION	233700 SF	4674	0	0	0	219678	0	10984	230662
115 .0214822.	HAUL ROOFING & SIDING TO COLMA DUMP (INCL FEE)	26000 CY	0	0	0	0	780000	0	39000	819000
115 .0214824.	REMOVE & HAUL OFF INTERIOR WALLS & PARTITIONS	1 LS	3500	0	0	0	500000	0	25000	525000
115 .0214825.	REMOVE & HAUL OFF PIPING & ELECTRICS	1 LS	2000	0	0	0	285000	0	14250	299250
TOTAL	DEMOLITION - TRANSBAY TERMINAL		51,125	0	0	0	4,184,378	0	209,219	4,393,597
REPORT TOTAL			51,125	0	0	0	4,184,378	0	209,219	4,393,597

SEE STAGE 3.0
DEMOLITION OF TRANS BAY TERMINAL
$4,393,597 IS AN EXCERPT FROM ICF KAISER ESTIMATE

TOTAL OF :

- **$262,500 FOR TRAFFIC CONTROL**
- **($1,252,860+$214,305)/15,700CY = $93.45/CY FOR CONCRETE DEMOLITION AND OFF-HAUL.**
- **($888,300+$15,120-113,400)/3,600 TN = $219/TON FOR STEEL DEMOLITION, OFF-HAUL AND SALVAGE.**
- **($230,662+819,000)/26,000 CY = $40.37/CY FOR ROOFING AND SIDING DEMOLITION AND OFF-HAUL TO DUMP**
- **($525,000+$299,250 = $824,250 FOR REMOVE & OFF-HAUL INTERIOR WALL & PARTITIONS, AND REMOVE & OFF-HAUL PIPING & ELECTRICAL.**

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
376	TEMPORARY BUS PARKING									
376 .0000031.	ALT MB NORTH - OPTION A TEMPORARY BUS PARKING 44 SPACES	1 LS	0	0	0	0	0	0	0	0
376 .0214108.	CLEAR DEBRIS ON RAMP	1 LS	24	0	0	0	1600	0	80	1680
376 .0220241.	HAUL TO DUMP - EXCAV MAT'L	15900 CY	1590	58862	64459	0	47303	0	51694	222318
376 .0220242.	DUMP FEE	15900 CY	0	0	0	0	190800	0	9540	200340
376 .0220338.	EXCAVATE & LOAD STOCKPILED EARTH	15775 CY	1262	50764	15318	0	0	0	26433	92515
376 .0225001.	PREPARE SUBGRADE	5910 SY	65	2791	1501	0	0	0	1717	6009
376 .0268005.	STORM DRAINAGE	1 LS	200	0	0	0	25000	0	1250	26250
376 .0271128.	FENCE, 8' HIGH, CHAIN LINK W/ BARBED WIRE	940 LF	193	6862	820	7139	0	0	3787	18608
376 .0271148.	FENCE GATE, VEHICLE 8' CHAIN LINK	80 LF	42	1493	180	3298	0	0	999	5970
376 .0282456.	AC PAVING INCL AGG BASE	5910 SY	520	0	0	0	265950	0	13298	279248
376 .0287374.	PARKING BUMPERS	44 EA	15	0	0	0	1540	0	77	1617
376 .0289814.	STRIPING - 4" WIDE	1750 LF	21	690	177	228	0	0	370	1465
376 .1573251.	FIRE PROTECTION	53200 SF	319	0	0	0	53200	0	2660	55860
376 .1610010.	YARD LIGHTING	53200 SF	0	0	0	0	18620	0	931	19551
TOTAL	TEMPORARY BUS PARKING		4,251	121,462	82,455	10,665	604,013	0	112,836	931,431
REPORT TOTAL			4,251	121,462	82,455	10,665	604,013	0	112,836	931,431

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT	CALC NO. _____ REV _____
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BUS FACILITIES	CHECKED BY Rev. 2 K Kalsi DATE 8/22/96

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE, TRANS BAY TERMINAL SHORT

QUANTITY AND UNIT COST SUMMARY

	Stage										Total Qty.	Units	Unit Cost	Total Cost	Comments
	0, 0.1, 1.0	1.1	2.0	2.1	2.2	2.3	2.4	2.5	2.6	3					
Concrete		43,721		43,279		N/A	N/A	N/A	N/A	N/A	86,999	CY	$ 37.00	$ 3,218,978	See stage 0, 0.1, 1.0 sheet
Demolition	0	0	0	15,700	0	N/A	N/A	N/A	N/A	N/A	15,700	CY	$ 93.45	$ 1,467,165	Unit cost per KE TBT Demo est.
Steel Demolition	0	1,150	0	3600	0	N/A	N/A	N/A	N/A	N/A	4,750	TN	$ 219.0	$ 1,040,250	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Roofing And Siding Demo.	0	0	0	26000	0	N/A	N/A	N/A	N/A	N/A	26,000	CY	$ 40.4	$ 1,049,620	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Demo. Misc. TBT material	0	0	0	1	0	N/A	N/A	N/A	N/A	N/A	1	LS	$ 824,250.0	$ 824,250	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Ramp Construction	0	0	0	0	186,040	N/A	N/A	N/A	N/A	N/A	186,040	SF	$ 120.0	$ 22,324,800	Dim. from aerial photo scale Unit cost per P.B. estimate
TBT (Short) Construction	0	0	0	0	1	N/A	N/A	N/A	N/A	N/A	1	EACH	$ 58,806,123	$ 58,806,123	Unit cost from P.B. estimate
Temp/Perm.	0	0	1	0	0	N/A	N/A	N/A	N/A	N/A	1	Allow	$ 4,000,000	$ 4,000,000	
Bus Storage	1	0	0	0	0	N/A	N/A	N/A	N/A	N/A	1	LS	$ 931,431	$ 931,431	Unit cost per ICF KE estimate
Temp. Bus Turn Around	1	0	0	0	0	N/A	N/A	N/A	N/A	N/A	1	Allow	$ 300,000	$ 300,000	
2nd Street Approach	0	0	0	0	6600	N/A	N/A	N/A	N/A	N/A	6600	SF	$ 25	$ 165,000	Unit cost & count from P.B. estimate
Street & Road Modifications	0	0	1	0	0	N/A	N/A	N/A	N/A	N/A	1	Each	$ 640,770	$ 640,770	Unit cost & count from P.B. estimate
Utility Relocation	0.2	0.2	0.2	0.2	0.2	N/A	N/A	N/A	N/A	N/A	1	Allow	$ 300,000	$ 300,000	
Traffic Control	0.25	0.25	0.25	1	0.25	N/A	N/A	N/A	N/A	N/A	2	LS	$ 262,500	$ 525,000	Dim & unit cost from KE TBT demo. estimate.

SUBTOTAL - TRANS BAY TERMINAL (SHORT) =		$ 95,593,387
RIGHT-OF-WAY=		$ 3,000,000
ENGINEERING & ADMINISTRATION =	25%	$ 23,898,347
CONTINGENCY =	25%	$ 29,872,945
PROJECT RESERVE =	8%	$ 11,949,178
TOTAL - TRANS BAY TERMINAL (SHORT) =		$ 164,313,857

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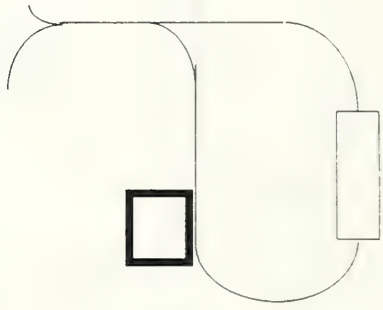
Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL SHORT

Stage 0 Existing Condition
Stage 0.1 Caltrans Constructs New Fremont Street Off-Ramp

Stage 1.0 Modify Existing Bus Terminal



Modify Existing Terminal:

Say $300,000

Temporary Storage for Buses: (See estimate by ICF KE)

$931,431 per ICF KE estimate

Total = $ 931,431

CALCULATION FOR UNIT COST OF RAMP DEMOLITION

Per phone conversation with P.B. rep (August 16, 1996), cost per square foot of concrete ramp demolition should be approximately $13.00/SF. Convert to cubic yard unit cost.

Ramp demolition area = 289,000 sf
Ramp demolition volume = 102,699 cy

($13.00/SF)*(289,000 SF / 102,699 CY)= $ 36.58 /CY

USE $37.00 / CY

ICF KAISER	JOB NO. 65928-005-06
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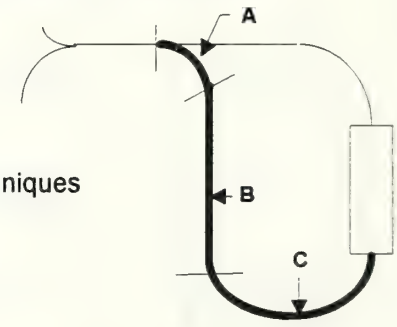
Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL SHORT

Stage 1.1 Demolish Inbound Bus Loop and Fremont Street Off-Ramp Parallel to Folsom Street

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)

Superstructure: (average depth = approx. 4.5' for concrete girders & 3' for steel girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
Area A =	350	80	4.5	1.5	189,000	7,000
Area B (bus) =	1000	30	4.5	1.5	202,500	7,500
Area B (vehicle)	620	30	4.5	1.5	125,550	4,650
Area C =	900	75	3	1.5	303,750	11,250
Total =						30,400 CY

Columns:

Concrete:

	Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
Area A =	18	30	25	1.5	20250	750
Area B =	83	30	25	1.5	93375	3,458
Area C =	38	30	25	1.5	42750	1,583
						5,792 CY

Bent Cap:

Bent cap volume = approx. = 30% column 1,738 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column 5,792 CY

TOTAL CONCRETE DEMO. THIS PAGE = 43,721 CY

Steel:

Girders supporting deck in area "C" = 1,150 Tons

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Stage construction information obtained from "Stage Construction Drawings, #182-186

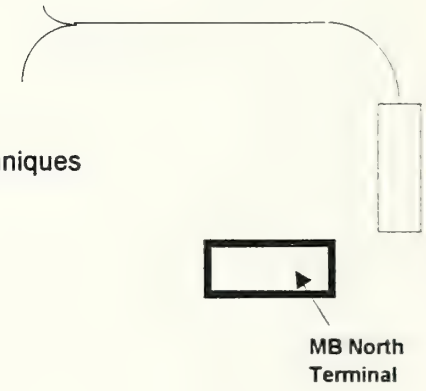
ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL SHORT

Stage 2.0 Construct Temporary Bus Terminal

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)



New MB North Temporary Bus Terminal

Temporary Terminal, Area = 650'x275' = 180,000 SQFT
180,000 SQFT x $22.33/SQFT = $4,000,000

Total MB North Transit Terminal =	$ 4,000,000

Street & Road Modifications: 1 (see P.B. estimate for cost breakdown)

Per P.B. Estimate Street an Roadway Modifications =	$ 340,770
Includes 2 traffic signals	
Add $300,000 for misc. modifications =	$ 300,000
	$ 640,770

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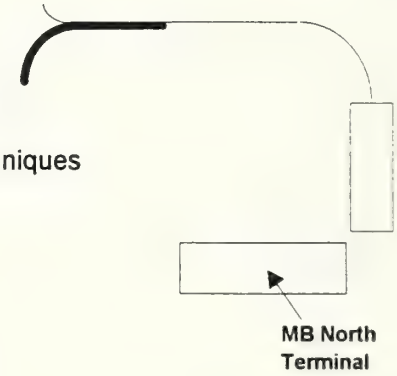
Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL SHORT

Stage 2.1 Demolish Fremont street off-ramp parallel to Essex street

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)

Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	1200	22	4.5	1.5	178,200	6,600 CY

Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
26	30	25	1.5	29250	1,083 CY

Bent Cap:

Bent cap volume = approx. = 30% column — 325 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column — 1,083 CY

TOTAL CONCRETE DEMO. THIS PAGE = 9,092 CY

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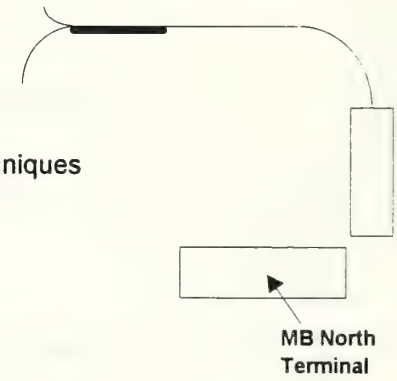
Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.1 (continued) Demolish Existing Bus Ramp (Original Train Structure) Between Harrison and Folsom Street

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)

Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	750	30	4.5	1.5	151,875	5,625 CY

Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
16	15	25	1.5	9000	333 CY

Bent Cap:

Bent cap volume = approx. = 30% column	100 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column	333 CY

TOTAL CONCRETE DEMO. THIS PAGE =	6,392 CY

ICF KAISER	JOB NO. 65928-005-06
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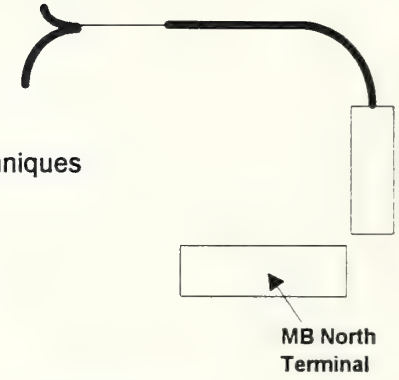
Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.1 (Continued) Demolish Remaining Ramps

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)
4. Information from ICF Kaiser TBT Demolition estimate

Demolish Ramp Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
Bay Bridge Ramp	520	30	4.5	1.5	105,300	3,900
T.B.T. Approach	460	120	4.5	1.5	372,600	13,800
T.B.T. Approach	600	40	4.5	1.5	162,000	6,000
						23,700 CY

Demolish Ramp Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
8	30	25	1.5	9000	333 CY
21	30	25	1.5	23625	875 CY
50	30	4.91	1.5	11047.5	409 CY
					1,618 CY

Demolish Ramp Bent Cap:

Bent cap volume = approx. = 30% column 485 CY

Demolish Ramp Foundation:

Foundation volume assumed to be = approx. same volume as column 1,618 CY

Demolish old Second St. Ramps: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	50	30	4.5	1.5	10,125	375 CY

TOTAL RAMP DEMOLITION THIS PAGE = 27,795 CY

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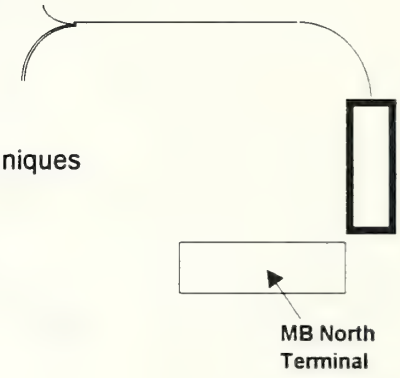
Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.1 (Continued) Demolish Transbay Terminal

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)
4. Information from ICF Kaiser TBT Demolition estimate

Trans Bay Terminal Demolition: (See attached ICF KE TBT Demolition Estimate)

CONCRETE DEMOLITION	15,700	CY
STEEL DEMOLITION, OFF-HAUL & SALVAGE	3,600	TONS
ROOFING DEMOLITION & OFF-HAUL	26,000	CY
TRAFFIC CONTROL	1	LS
INTERIOR, MECHANICAL & ELECTRICAL	1	LS

Quantity Summary for Stage 2.1

CONCRETE DEMOLITION	58,979	CY
STEEL DEMOLITION, OFF-HAUL & SALVAGE	3,600	TONS
ROOFING DEMOLITION & OFF-HAUL	26,000	CY
TRAFFIC CONTROL	1	LS
INTERIOR, MECHANICAL & ELECTRICAL	1	LS

ICF KAISER	JOB NO. 65928-005-06
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Stage construction information obtained from "Stage Construction Drawings, #182-186

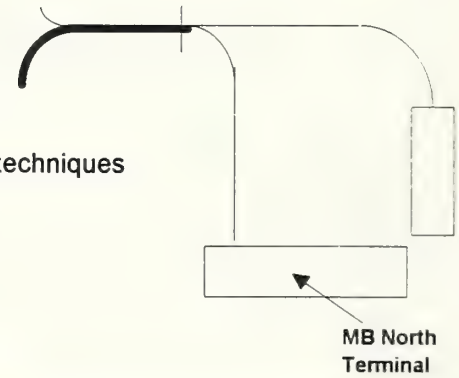
ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL SHORT

Stage 2.2 Construct East half of new bus ramp parallel to Essex St.

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)



New bus ramp (part) parallel. to Essex: (unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	650	32	20,800	
			20,800	ft^2

TOTAL NEW CONCRETE THIS PAGE =	20,800 SF

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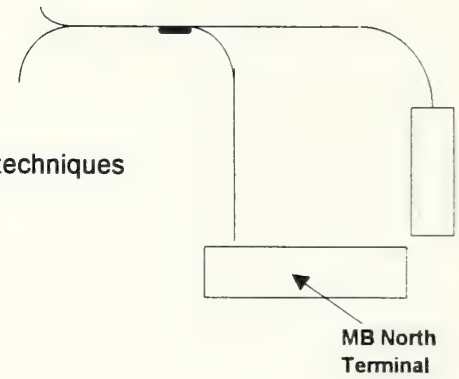
Stage construction information obtained from "Stage Construction Drawings, #182-186

Sage 2.2 (Continued) Construct East half of new bus ramp over Folsom Street

Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)

New bus ramp (part) parallel. to Essex over Folsom:
(unit cost to be applied $125.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	120	32	3,840	
			3,840	ft^2

TOTAL NEW CONCRETE THIS PAGE =	3,840 SF

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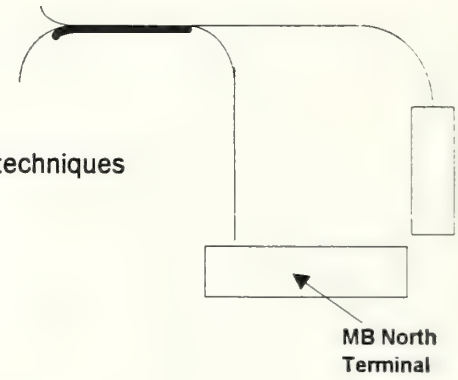
Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.2 (Continued) Construct West Half of New Bus Ramp Parallel to Essex Street

Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)

New bus ramp (part) West Half parallel. to Essex over Folsom:
(unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	1100	14	15,400	
			15,400	ft^2

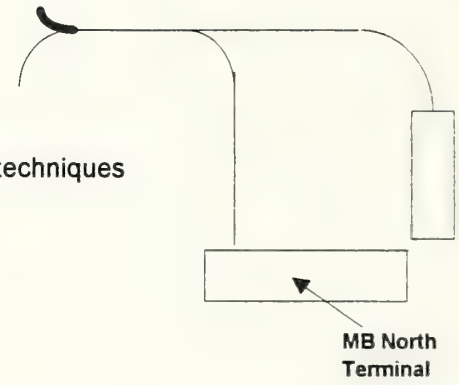
TOTAL NEW CONCRETE THIS PAGE =	15,400 SF

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.2 (continued) Construct At-Grade Crossing South of Harrison Street, Demolish old 2nd Street Ramp

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)

Construct At-Grade Crossing South of Harrison Street

(unit cost to be applied $7.00/sf from P.B. estimate)

# of segments	Length	Width	Area	
	ft	ft	ft^2	
2	300	22	6,600	
			6,600	ft^2

TOTAL NEW CONCRETE THIS PAGE =	6,600 SF

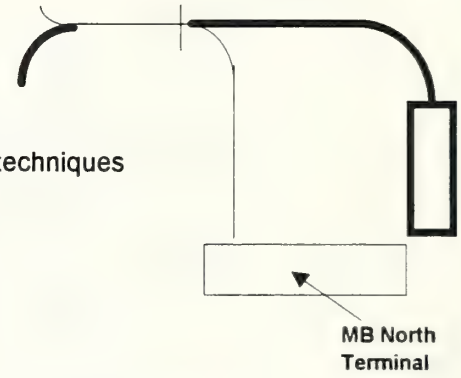
P.B.'s estimate indicates a unit cost of $7.00/sf of at grade paving. However, since said ramps must match aerial ramps at ramp interface increase by $18/sf. **SAY $25/SF**

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.2 (Continued) Construct New Transbay Terminal and Approuch Ramp

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)
4. Information from ICF Kaiser TBT Demolition estimate

Construct Ramp Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Total ft^2
	520	30	15,600
T.B.T. Approach	460	140	64,400
T.B.T. Approach	600	110	66,000
		Total	146,000

Per P.B. Estimate, use $120 / SF

TOTAL NEW CONCRETE THIS PAGE =	146,000.00	SF

New Trans Bay Terminal (Short)

For Backup, See Attachement Sheet

Terminal : (see P.B. estimate for cost breakdown)	$ 55,796,708
~~Temporary Bus Terminal=~~	~~$ 2,100,000~~
Plus P.B.'s "Grade level elements " (not shared) =	$ 3,009,415

Total MB North Transit Terminal =	$ 58,806,123

ATTACHMENT #1

Transbay Terminal Short

Parsons Brinckerhoff Construction Services, Inc.
Project: Transbay Terminal
Client: City of San Francisco
Date : 15-Oct-95

Re: **Transbay Terminal - (Option TB Short)**

	Description	Qty.	Units	Unit Price	Subtotal	Total (1995$)
	RAMPS					
1	Demolition - Existing Bus Ramps					$3,930,625
	Inbound/Outbound for Buses	47,000	SF	$16.88	$793,125	
	Traffic Off-Ramp	51,000	SF	$12.50	$637,500	
	Inbound Viaduct	130,000	SF	$12.50	$1,625,000	
	Outbound Viaduct	70,000	SF	$12.50	$875,000	
2	New Bus Ramps					$22,500,000
	Bus Off-Ramp Viaduct	17,500	SF	$120.00	$2,100,000	
	Approach Viaduct	170,000	SF	$120.00	$20,400,000	
	Traffic Off-Ramp	38,000	SF	$120.00	by others	
3	Street and Roadway Modifications					$340,770
	A.C. Transit Bus Pavement to Storage Are	20,110	SF	$7.00	$140,770	
	Traffic Signal Mod. @ 2nd for A.C. Transit	1	LS	$100,000.00	$100,000	
	Traffic Signal Mod. @ Folsom/	1	LS	$100,000.00	$100,000	
4	Seismic Upgrades	1	LS	NIC	NIC	
5	R.O.W. Take	1	LS	NIC	NIC	
				SUBTOTAL RAMPS		**$26,771,395**
	TRANSBAY TERMINAL					
1	Demolition - Existing TBT	1	LS	NIC		NIC
2	Foundation - TBT	1	LS	NIC		NIC
3	Structural Steel					$14,601,596
	Structural Steel (Wgts. > 40#/LF)	12,452,722	LBS	$1.08	$13,389,790	
	Mtl. Decking 3" - 20ga.	383,180	SF	$3.16	$1,211,807	
4	Lightweight Concrete	7,138	CY	$250.00		$1,784,567
5	6 x 6 - w2.0 x w2.0 Mesh (+10%)	455,928	SF	$0.60		$273,557
6	Waterproofing	414,480	SF	$2.00		$828,960
7	Miscellaneous Metals (Wgts. < 40#/LF)	360,000	LBS	$2.00		$720,000
8	Spandrel Beam Exterior	24,120	SF	$25.00		$603,000
9	Architectural (Shared)	1	LS	$14,704,029		$14,704,029
10	Vertical Circulation	1	LS	$15,505,000		$15,505,000
11	Fire Protection	352,000	SF	$6.00		$2,112,000
12	Plumbing	352,000	SF	$4.00		$1,408,000
13	Ventilation	352,000	SF	$2.75		$968,000
14	Electrical	352,000	SF	$6.50		$2,288,000
				SUBTOTAL TRANSBAY TERMINAL		**$55,796,708**
	TEMPORARY BUS TERMINAL					
1	Temporary Bus Terminal	1	LS	$2,100,000.00		$2,100,000
				SUBTOTAL TEMPORARY BUS TERMINAL		**$2,100,000**
				SUBTOTAL RAMPS, TBT, & TEMPORARY BUS (w/o contingency)		**$84,668,103**
				CONTINGENCY	**25%**	**$21,167,026**
				MANAGEMENT ADD-ON ALLOWANCE	**25%**	**$26,458,782**
				PROJECT RESERVE	**8%**	**$10,583,513**
					TOTAL	**$142,877,424**

18,811,680

Parsons Brinckerhoff Computation Sheet

Subject _____

Page _____ of _____

Made by _____

Date _____

Checked by _____

Date _____

ATTACHMENT #2

15,904,424
~~14,913,444~~

TOTAL ARCHITECTURAL

MINUS:

PLG. ALLOWANCE	644,469
PLATFORM ROOFS	~~578000~~
PLATFORM ENCLOSURE	~~1231020~~
QUARRY TILE PLATFORMS	662,400
WEATHER PROTECTION CANOPIES	3425625
STAIRS	45,000
PLAZA AREA	1,350,000
PED-CROSSWALKS	~~324,000~~
PED. SIGNALS	225,000
BENCHS	120,000
CCTV, ACCESS CARDS, ETC. 399300 x 7[00]	2,795,100
MUNI TURNAROUND	294,000

(9,885,594) ~~(11,694,614~~

(6,018,830) ~~6,018,830~~

$3009,415 ~~3,009,415~~

Transbay Terminal Short

Parsons Brinckerhoff Construction Services, Inc.
Project: Transbay Terminal
Client: City of San Francisco
Date : 15-Oct-95

Re: **Transbay Terminal - (Option TB Short)**

	Description	Qty.	Units	Unit Price	Subtotal	Total (1995$)
	RAMPS					
1	Demolition - Existing Bus Ramps					$3,930,625
	Inbound/Outbound for Buses	47,000	SF	$16.88	$793,125	
	Traffic Off-Ramp	51,000	SF	$12.50	$637,500	
	Inbound Viaduct	130,000	SF	$12.50	$1,625,000	
	Outbound Viaduct	70,000	SF	$12.50	$875,000	
2	New Bus Ramps					$22,500,000
	Bus Off-Ramp Viaduct	17,500	SF	$120.00	$2,100,000	
	Approach Viaduct	170,000	SF	$120.00	$20,400,000	
	Traffic Off-Ramp	38,000	SF	$120.00	by others	
3	Street and Roadway Modifications					$340,770
	A.C. Transit Bus Pavement to Storage Are	20,110	SF	$7.00	$140,770	
	Traffic Signal Mod. @ 2nd for A.C. Transit	1	LS	$100,000.00	$100,000	
	Traffic Signal Mod. @ Folsom/	1	LS	$100,000.00	$100,000	
4	Seismic Upgrades	1	LS	NIC	NIC	
5	R.O.W. Take	1	LS	NIC	NIC	
				SUBTOTAL RAMPS		**$26,771,395**
	TRANSBAY TERMINAL					
1	Demolition - Existing TBT	1	LS	NIC		NIC
2	Foundation - TBT	1	LS	NIC		NIC
3	Structural Steel					$14,601,596
	Structural Steel (Wgts. > 40#/LF)	12,452,722	LBS	$1.08	$13,389,790	
	Mtl. Decking 3" - 20ga.	383,180	SF	$3.16	$1,211,807	
4	Lightweight Concrete	7,138	CY	$250.00		$1,784,567
5	6 x 6 - w2.0 x w2.0 Mesh (+10%)	455,928	SF	$0.60		$273,557
6	Waterproofing	414,480	SF	$2.00		$828,960
7	Miscellaneous Metals (Wgts. < 40#/LF)	360,000	LBS	$2.00		$720,000
8	Spandrel Beam Exterior	24,120	SF	$25.00		$603,000
9	Architectural (Shared)	1	LS	$14,704,029		$14,704,029
10	Vertical Circulation	1	LS	$15,505,000		$15,505,000
11	Fire Protection	352,000	SF	$6.00		$2,112,000
12	Plumbing	352,000	SF	$4.00		$1,408,000
13	Ventilation	352,000	SF	$2.75		$968,000
14	Electrical	352,000	SF	$6.50		$2,288,000
				SUBTOTAL TRANSBAY TERMINAL		**$55,796,708**
	TEMPORARY BUS TERMINAL					
1	Temporary Bus Terminal	1	LS	$2,100,000.00		$2,100,000
				SUBTOTAL TEMPORARY BUS TERMINAL		**$2,100,000**
				SUBTOTAL RAMPS, TBT, & TEMPORARY BUS (w/o contingency)		**$84,668,103**
				CONTINGENCY	**25%**	$21,167,026
				MANAGEMENT ADD-ON ALLOWANCE	**25%**	$26,458,782
				PROJECT RESERVE	**8%**	$10,583,513
					TOTAL	**$142,877,424**

ICF KAISER ENGINEERS, INC.
SAN FRANCISCO, CALIFORNIA
JOB NO. 65928-005-05

ICF KAISER ENGINEERS INTERACTIVE ESTIMATING
CALTRAIN DOWNTOWN EXTENSION

REPORT D1 - ESTIMATE DETAIL BY FACILITY

DATE: 05/07/96 15:06
BY BCC/RLM/NWH

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
115			DEMOLITION - TRANSBAY TERMINAL									
115		.0214810.	TRAFFIC CONTROL	1 LS	5000	0	0	0	250000	0	12500	262500
115		.0214811.	CONCRETE DEMOLITION	15700 CY	22451	0	0	0	1193200	0	59660	1252860
115		.0214812:	HAUL CONCRETE TO GRINDING & RECYCLING PLANT	15700 CY	0	0	0	0	204100	0	10205	214305
115		.0214815.	STRUCT STEEL DISMANTLING	3600 TN	13500	0	0	0	846000	0	42300	888300
115		.0214816.	HAUL STEEL TO SALVAGE YARD	3600 TN	0	0	0	0	14400	0	720	15120
115		.0214817.	STEEL SALVAGE VALUE	3600 TN	0	0	0	0	-108000	0	-5400	-113400
115		.0214821.	ROOFING & SIDING DEMOLITION	233700 SF	4674	0	0	0	219678	0	10984	230662
115		.0214822.	HAUL ROOFING & SIDING TO COLMA DUMP (INCL FEE)	26000 CY	0	0	0	0	780000	0	39000	819000
115		.0214824.	REMOVE & HAUL OFF INTERIOR WALLS & PARTITIONS	1 LS	3500	0	0	0	500000	0	25000	525000
115		.0214825.	REMOVE & HAUL OFF PIPING & ELECTRICS	1 LS	2000	0	0	0	285000	0	14250	299250
	TOTAL		DEMOLITION - TRANSBAY TERMINAL		51,125	0	0	0	4,184,378	0	209,219	4,393,597
REPORT TOTAL					51,125	0	0	0	4,184,378	0	209,219	4,393,597

SEE STAGE ~~1~~ 2.1
DEMOLITION OF TRANS BAY TERMINAL
$4,393,597 IS AN EXCERPT FROM ICF KAISER ESTIMATE

TOTAL OF :

- **$262,500 FOR TRAFFIC CONTROL**
- **($1,252,860+$214,305)/15,700CY = $93.45/CY FOR CONCRETE DEMOLITION AND OFF-HAUL.**
- **($888,300+$15,120-113,400)/3,600 TN = $219/TON FOR STEEL DEMOLITION, OFF-HAUL AND SALVAGE.**
- **($230,662+819,000)/26,000 CY = $40.37/CY FOR ROOFING AND SIDING DEMOLITION AND OFF-HAUL TO DUMP**
- **($525,000+$299,250 = $824,250 FOR REMOVE & OFF-HAUL INTERIOR WALL & PARTITIONS, AND REMOVE & OFF-HAUL PIPING & ELECTRICAL.**

--WORK BREAKDOWN--- FACIL.STANDRD.WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
376	TEMPORARY BUS PARKING									
376 .0000031.	ALT MB NORTH - OPTION A TEMPORARY BUS PARKING 44 SPACES	1 LS	0	0	0	0	0	0	0	0
376 .0214108.	CLEAR DEBRIS ON RAMP	1 LS	24	0	0	0	1600	0	80	1680
376 .0220241.	HAUL TO DUMP - EXCAV MAT'L	15900 CY	1590	58862	64459	0	47303	0	51694	222318
376 .0220242.	DUMP FEE	15900 CY	0	0	0	0	190800	0	9540	200340
376 .0220338.	EXCAVATE & LOAD STOCKPILED EARTH	15775 CY	1262	50764	15318	0	0	0	26433	92515
376 .0225001.	PREPARE SUBGRADE	5910 SY	65	2791	1501	0	0	0	1717	6009
376 .0268005.	STORM DRAINAGE	1 LS	200	0	0	0	25000	0	1250	26250
376 .0271128.	FENCE, 8' HIGH, CHAIN LINK W/ BARBED WIRE	940 LF	193	6862	820	7139	0	0	3787	18608
376 .0271148.	FENCE GATE, VEHICLE 8' CHAIN LINK	80 LF	42	1493	180	3298	0	0	999	5970
376 .0282456.	AC PAVING INCL AGG BASE	5910 SY	520	0	0	0	265950	0	13298	279248
376 .0287374.	PARKING BUMPERS	44 EA	15	0	0	0	1540	0	77	1617
376 .0289814.	STRIPING - 4" WIDE	1750 LF	21	690	177	228	0	0	370	1465
376 .1573251.	FIRE PROTECTION	53200 SF	319	0	0	0	53200	0	2660	55860
376 .1610010.	YARD LIGHTING	53200 SF	0	0	0	0	18620	0	931	19551
TOTAL	TEMPORARY BUS PARKING		4,251	121,462	82,455	10,665	604,013	0	112,836	931,431
REPORT TOTAL			4,251	121,462	82,455	10,665	604,013	0	112,836	931,431

BY RLS/RM DATE 5/15/96 PROJECT Caltrain SHEET NO. ____ OF ____

CHKD. BY ____ DATE Stage Constr. for JOB NO. ____

TBT Short & Medium

Stages	Description
0.1	CalTrans constructs Fremont ramp
1.0	Modify exist. terminal & construct temp. storage at Folsom/Beale
1.1	Demo inbound bus loop & Fremont off-ramp
2.0	Construct Temp. Bus Station at Main - Beale (btw. Folsom & Howard) At end move all bus traffic to new Temp. Bus Station via new Fremont St. ramp
2.1	Demolish remaining outbound ramps all the way to TBT & TBT itself.
2.2	Reconstruct bus ramps from I-80 to TBT & construct new TBT Short or Medium aerial bus station along with JPB train station (in conjunction w/ clc JPB track)

Same as HB

Parsons Brinckerhoff **Computation Sheet**

Subject _____

Page _____ of _____

Made by _____

Date _____

Checked by _____

Date _____

TB - MEDIUM

TOTAL ARCHITECTURAL $19,616,764

MINUS:

FIG. ALLOWANCE		600,475
PLATFORM ROOFS		816,000
PLATFORM ENCLOSURE		2,249,750
QUARRY TILE PLATFORMS		883,600
WEATHER PROTECTION CANOPIES		3,780,000
STAIRS		———
PLAZA AREA		1,250,000
PED-CROSSWALKS		432,000
PED. SIGNALS		300,000
BENCHS		
CCTV, ACCESS CARDS, ETC.	361080 / 144300 × 7.00	360,000
SIGNAGE & GRAPHICS	361080 × 1.50	2,527,560
MUNI TURNAROUND		432,296
		294,000

(14,026,661

5,590,103

÷2 = 2,795,052

Transbay Medium

Parsons Brinckerhoff Construction Services, Inc.
Project: Transbay Terminal
Client: City of San Francisco
Date : 15-Oct-95

Re: Transbay Terminal - (Option TB Medium)

	Description	Qty.	Units	Unit Price	Subtotal	Total (1995$)
	RAMPS					
1	Demolition - Existing Bus Ramps					$3,930,625
	Inbound/Outbound for Buses	47,000	SF	$16.88	$793,125	
	Traffic Off-Ramp	51,000	SF	$12.50	$637,500	
	Inbound Viaduct	130,000	SF	$12.50	$1,625,000	
	Outbound Viaduct	70,000	SF	$12.50	$875,000	
2	New Bus Ramps					$22,968,000
	Bus Off-Ramp Viaduct	21,400	SF	$120.00	$2,568,000	
	Approach Viaduct	170,000	SF	$120.00	$20,400,000	
	Traffic Off-Ramp	38,000	SF	$120.00	by others	
3	Street and Roadway Modifications					$340,770
	A.C. Transit Bus Pavement to Storag	20,110	SF	$7.00	$140,770	
	Traffic Signal Mod. @ 2nd for A.C. T	1	LS	$100,000.00	$100,000	
	Traffic Signal Mod. @ Folsom/	1	LS	$100,000.00	$100,000	
4	Seismic Upgrades	1	LS	NIC	NIC	
5	R.O.W. Take	1	LS	NIC	NIC	
				SUBTOTAL RAMPS		**$27,239,395**
	TRANSBAY TERMINAL					
1	Demolition - Existing TBT	1	LS	NIC		NIC
2	Foundation - TBT	1	LS	NIC		NIC
3	Structural Steel					$13,099,050
	Structural Steel (Wgts. > 40#/LF)	11,055,330	LBS	$1.08	$11,887,243	
	Mtl. Decking 3" - 20ga.	383,180	SF	$3.16	$1,211,807	
4	Lightweight Concrete	6,599	CY	$250.00		$1,649,803
5	6 x 6 - w2.0 x w2.0 Mesh (+10%)	421,498	SF	$0.60		$252,899
6	Waterproofing	383,180	SF	$2.00		$766,360
7	Miscellaneous Metals (Wgts. < 40#/LF)	360,000	LBS	$2.00		$720,000
8	Spandrel Beam Exterior	65,280	SF	$25.00		$1,632,000
9	Architectural (Shared)	1	LS	$16,821,712.25		$16,821,712
10	Vertical Circulation	1	LS	$5,645,000.00		$5,645,000
11	Fire Protection	480,380	SF	$6.00		$2,882,280
12	Plumbing	480,380	SF	$4.00		$1,921,520
13	Ventilation	480,380	SF	$2.75		$1,321,045
14	Electrical	480,380	SF	$6.50		$3,122,470
				SUBTOTAL TRANSBAY TERMINAL		**$49,834,139**
	TEMPORARY BUS TERMINAL					
1	Temporary Bus Terminal	1	LS	$2,100,000.00		$2,100,000
				SUBTOTAL TEMPORARY BUS TERMINAL		**$2,100,000**
				SUBTOTAL RAMPS, TBT, & TEMPORARY BUS (w/o contingency)		**$79,173,534**
				CONTINGENCY	**25%**	**$19,793,383**
				MANAGEMENT ADD-ON ALLOWANCE	**25%**	**$24,741,729**
				PROJECT RESERVE	**8%**	**$9,896,692**
					TOTAL	**$133,605,338**

ICF KAISER ENGINEERS, INC.
SAN FRANCISCO, CALIFORNIA
JOB NO. 65928-005-05

ICF KAISER ENGINEERS INTERACTIVE ESTIMATING
CALTRAIN DOWNTOWN EXTENSION

REPORT D1 - ESTIMATE DETAIL BY FACILITY

PAGE 1
DATE: 05/07/96 15:06
BY BCC/RLM/HWH

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
115			DEMOLITION - TRANSBAY TERMINAL									
115		.0214810.	TRAFFIC CONTROL	1 LS	5000	0	0	0	250000	0	12500	262500
115		.0214811.	CONCRETE DEMOLITION	15700 CY	22451	0	0	0	1193200	0	59660	1252860
115		.0214812:	HAUL CONCRETE TO GRINDING & RECYCLING PLANT	15700 CY	0	0	0	0	204100	0	10205	214305
115		.0214815.	STRUCT STEEL DISMANTLING	3600 TN	13500	0	0	0	846000	0	42300	888300
115		.0214816.	HAUL STEEL TO SALVAGE YARD	3600 TN	0	0	0	0	14400	0	720	15120
115		.0214817.	STEEL SALVAGE VALUE	3600 TN	0	0	0	0	-108000	0	-5400	-113400
115		.0214821.	ROOFING & SIDING DEMOLITION	233700 SF	4674	0	0	0	219678	0	10984	230662
115		.0214822.	HAUL ROOFING & SIDING TO COLMA DUMP (INCL FEE)	26000 CY	0	0	0	0	780000	0	39000	819000
115		.0214824.	REMOVE & HAUL OFF INTERIOR WALLS & PARTITIONS	1 LS	3500	0	0	0	500000	0	25000	525000
115		.0214825.	REMOVE & HAUL OFF PIPING & ELECTRICS	1 LS	2000	0	0	0	285000	0	14250	299250
	TOTAL		DEMOLITION - TRANSBAY TERMINAL		51,125	0	0	0	4,184,378	0	209,219	4,393,597
REPORT TOTAL					51,125	0	0	0	4,184,378	0	209,219	4,393,597

SEE STAGE ~~3.0~~ 2.1
DEMOLITION OF TRANS BAY TERMINAL
$4,393,597 IS AN EXCERPT FROM ICF KAISER ESTIMATE

TOTAL OF :

- **$262,500 FOR TRAFFIC CONTROL**
- **($1,252,860+$214,305)/15,700CY = $93.45/CY FOR CONCRETE DEMOLITION AND OFF-HAUL.**
- **($888,300+$15,120-113,400)/3,600 TN = $219/TON FOR STEEL DEMOLITION, OFF-HAUL AND SALVAGE.**
- **($230,662+819,000)/26,000 CY = $40.37/CY FOR ROOFING AND SIDING DEMOLITION AND OFF-HAUL TO DUMP**
- **($525,000+$299,250 = $824,250 FOR REMOVE & OFF-HAUL INTERIOR WALL & PARTITIONS, AND REMOVE & OFF-HAUL PIPING & ELECTRICAL.**

--WORK BREAKDOWN--- FACIL.	STANDRD.	WKPKG	DESCRIPTION	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P	TOTAL DOLLARS
376			TEMPORARY BUS PARKING									
376		.0000031.	ALT MB NORTH - OPTION A TEMPORARY BUS PARKING 44 SPACES	1 LS	0	0	0	0	0	0	0	0
376		.0214108.	CLEAR DEBRIS ON RAMP	1 LS	24	0	0	0	1600	0	80	1680
376		.0220241.	HAUL TO DUMP - EXCAV MAT'L	15900 CY	1590	58862	64459	0	47303	0	51694	222318
376		.0220242.	DUMP FEE	15900 CY	0	0	0	0	190800	0	9540	200340
376		.0220338.	EXCAVATE & LOAD STOCKPILED EARTH	15775 CY	1262	50764	15318	0	0	0	26433	92515
376		.0225001.	PREPARE SUBGRADE	5910 SY	65	2791	1501	0	0	0	1717	6009
376		.0268005.	STORM DRAINAGE	1 LS	200	0	0	0	25000	0	1250	26250
376		.0271128.	FENCE, 8' HIGH, CHAIN LINK W/ BARBED WIRE	940 LF	193	6862	820	7139	0	0	3787	18608
376		.0271148.	FENCE GATE, VEHICLE 8' CHAIN LINK	80 LF	42	1493	180	3298	0	0	999	5970
376		.0282456.	AC PAVING INCL AGG BASE	5910 SY	520	0	0	0	265950	0	13298	279248
376		.0287374.	PARKING BUMPERS	44 EA	15	0	0	0	1540	0	77	1617
376		.0289814.	STRIPING - 4" WIDE	1750 LF	21	690	177	228	0	0	370	1465
376		.1573251.	FIRE PROTECTION	53200 SF	319	0	0	0	53200	0	2660	55860
376		.1610010.	YARD LIGHTING	53200 SF	0	0	0	0	18620	0	931	19551
	TOTAL		TEMPORARY BUS PARKING		4,251	121,462	82,455	10,665	604,013	0	112,836	931,431
REPORT TOTAL					4,251	121,462	82,455	10,665	604,013	0	112,836	931,431

ENGINEERING COMPANY

BY RLS/RM DATE 5/3/13 PROJECT _____ SHEET NO. _____ OF _____

CHKD. BY _____ DATE _____ JOB NO. _____

"B" Short - Medium

0.1

1.0

.1

2.0

2.1

2.2

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION PROJECT	CALC. NO. _____ REV. _____
	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY Rev. 2 K Kalsi DATE 8/22/96

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE, TRANS BAY TERMINAL MEDIUM

QUANTITY AND UNIT COST SUMMARY

	Stage										Total Qty.	Units	Unit Cost	Total Cost	Comments
	0, 0.1, 1.0	1.1	2.0	2.1	2.2	2.3	2.4	2.5	2.6	3					
Concrete	0	43,721	0	43,279	0	N/A	N/A	N/A	N/A	N/A	86,999	CY	$ 37.00	$ 3,218,978	See stage 0, 0.1, 1.0 sheet
Demolition	0	0	0	15,700	0	N/A	N/A	N/A	N/A	N/A	15,700	CY	$ 93.45	$ 1,467,165	Unit cost per KE TBT Demo est.
Steel Demolition	0	1,150	0	3,600	0	N/A	N/A	N/A	N/A	N/A	4,750	TN	$ 219.0	$ 1,040,250	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Roofing And Siding Demo.	0	0	0	26,000	0	N/A	N/A	N/A	N/A	N/A	26,000	CY	$ 40.4	$ 1,049,620	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Demo. Misc. TBT material	0	0	0	1	0	N/A	N/A	N/A	N/A	N/A	1	LS	$ 824,250.0	$ 824,250	Dim & unit cost from KE TBT demo. estimate (inc. salvage)
Ramp Construction	0	0	0	0	186,040	N/A	N/A	N/A	N/A	N/A	186,040	SF	$ 120.0	$ 22,324,800	Dim. from aerial photo scale Unit cost per P.B. estimate
TBT (Medium) Construction	0	0	0	0	1	N/A	N/A	N/A	N/A	N/A	1	EACH	$ 55,424,243	$ 55,424,243	Unit cost from P.B. estimate
Temp/Perm.	0	0	1	0	0	N/A	N/A	N/A	N/A	N/A	1	Allow	$ 4,000,000	$ 4,000,000	
Bus Storage	1	0	0	0	0	N/A	N/A	N/A	N/A	N/A	1	LS	$ 931,431	$ 931,431	Unit cost per ICF KE estimate
Temp. Bus Turn Around	1	0	0	0	0	N/A	N/A	N/A	N/A	N/A	1	Allow	$ 300,000	$ 300,000	
2nd Street Approach	0	0	0	0	6600	N/A	N/A	N/A	N/A	N/A	6600	SF	$ 25	$ 165,000	Unit cost & count from P.B. estimate
Street & Road Modifications	0	0	1	0	0	N/A	N/A	N/A	N/A	N/A	1	Each	$ 640,770	$ 640,770	Unit cost & count from P.B. estimate
Utility Relocation	0.2	0.2	0.2	0.2	0.2	N/A	N/A	N/A	N/A	N/A	1	Allow	$ 300,000	$ 300,000	
Traffic Control	0.25	0.25	0.25	1	0.25	N/A	N/A	N/A	N/A	N/A	2	LS	$ 262,500	$ 525,000	Dim & unit cost from KE TBT demo. estimate.

SUBTOTAL - TRANS BAY TERMINAL (MEDIUM) =		$ 92,211,507
RIGHT-OF-WAY=		$ 3,000,000
ENGINEERING & ADMINISTRATION =	25%	$ 23,052,877
CONTINGENCY =	25%	$ 28,816,107
PROJECT RESERVE =	8%	$ 11,526,443
TOTAL - TRANS BAY TERMINAL (MEDIUM) =		$ 158,606,935

ICF KAISER	JOB NO. 65928-005-06
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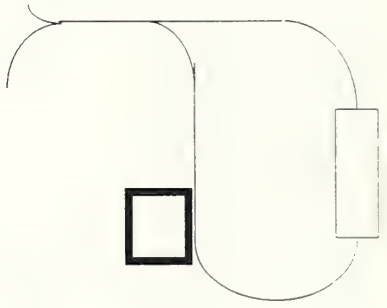
Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL MEDIUM

Stage 0 Existing Condition
Stage 0.1 Caltrans Constructs New Fremont Street Off-Ramp

Stage 1.0 Modify Existing Bus Terminal



Modify Existing Terminal:

Say $300,000

Temporary Storage for Buses: (See estimate by ICF KE)

$931,431 per ICF KE estimate

Total = $ 931,431

CALCULATION FOR UNIT COST OF RAMP DEMOLITION

Per phone conversation with P.B. rep (August 16, 1996), cost per square foot of concrete ramp demolition should be approximately $13.00/SF. Convert to cubic yard unit cost.

Ramp demolition area = 289,000 sf
Ramp demolition volume = 102,699 cy

($13.00/SF)*(289,000 SF / 102,699 CY) = 36.6 $/CY

USE $37.00 / CY

ICF KAISER	JOB NO. 65928-005-06
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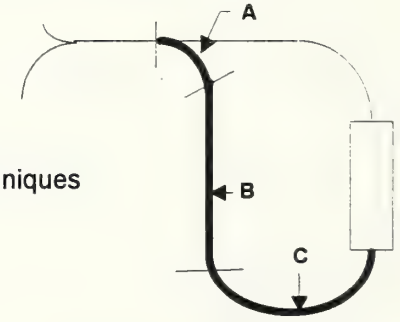
Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL MEDIUM

Stage 1.1 Demolish Inbound Bus Loop and Fremont Street Off-Ramp Parallel to Folsom Street



Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.

Superstructure: (average depth = approx. 4.5' for concrete girders & 3' for steel girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3	
Area A =	350	80	4.5	1.5	189,000	7,000	
Area B (bus) =	1000	30	4.5	1.5	202,500	7,500	
Area B (vehicle)	620	30	4.5	1.5	125,550	4,650	
Area C =	900	75	3	1.5	303,750	11,250	
Total =						30,400	CY

Columns:

Concrete:

	Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3	
Area A =	18	30	25	1.5	20250	750	
Area B =	83	30	25	1.5	93375	3,458	
Area C =	38	30	25	1.5	42750	1,583	
						5,792	CY

Bent Cap:

Bent cap volume = approx. = 30% column	1,738	CY

Foundation:

Foundation volume assumed to be = approx. same volume as column	5,792	CY
TOTAL CONCRETE DEMO. THIS PAGE =	43,721	CY

Steel:

Girders supporting deck in area "C" =	1,150	Tons

ICF KAISER	JOB NO. 65928-005-06
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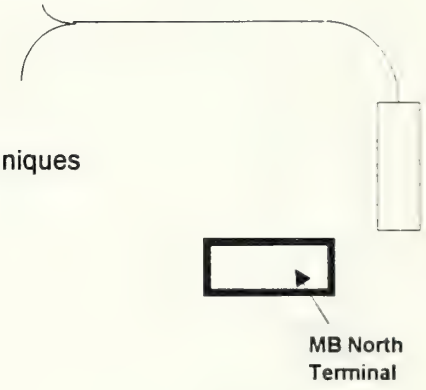
Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL MEDIUM

Stage 2.0 Construct Temporary Bus Terminal

Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.

New MB North Temporary Bus Terminal

Temporary Terminal, Area = 650'x275' = 180,000 SQFT
180,000 SQFT x $22.33/SQFT = $4,000,000

Total MB North Transit Terminal =	$ 4,000,000

Street & Road Modifications: 1 (see P.B. estimate for cost breakdown)

Per P.B. Estimate Street an Roadway Modifications =	$ 340,770
Includes 2 traffic signals	
Add $300,000 for misc. modifications =	$ 300,000
	$ 640,770

ICF KAISER	JOB NO. 65928-005-06
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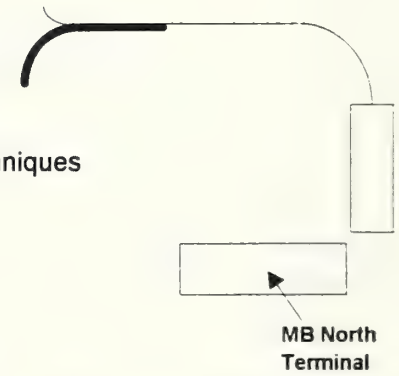
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL MEDIUM

Stage 2.1 Demolish Fremont street off-ramp parallel to Essex street

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.

Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	1200	22	4.5	1.5	178,200	6,600 CY

Columns:

Concrete:

	Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
	26	30	25	1.5	29250	1,083 CY

Bent Cap:

Bent cap volume = approx. = 30% column	325 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column	1,083 CY

TOTAL CONCRETE DEMO. THIS PAGE =	9,092 CY

ICF KAISER	JOB NO. 65928-005-06
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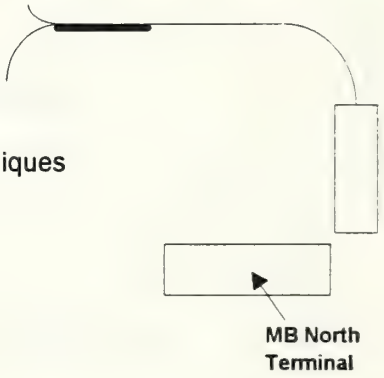
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.1 (continued) Demolish Existing Bus Ramp (Original Train Structure) Between Harrison and Folsom Street

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.

Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3
	750	30	4.5	1.5	151,875	5,625 CY

Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3
16	15	25	1.5	9000	333 CY

Bent Cap:

Bent cap volume = approx. = 30% column	100 CY

Foundation:

Foundation volume assumed to be = approx. same volume as column	333 CY

TOTAL CONCRETE DEMO. THIS PAGE =	6,392 CY

ICF KAISER	JOB NO. 65928-005-06
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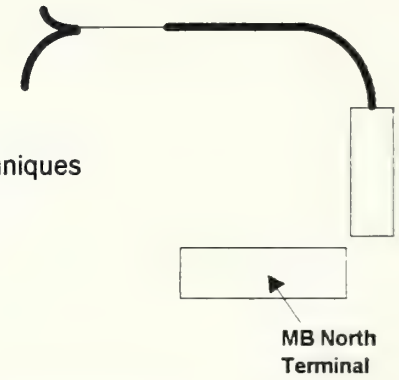
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.1 (Continued) Demolish Remaining Ramps

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.
4. Information from ICF Kaiser TBT Demolition estimate

Demolish Ramp Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3	
Bay Bridge Ramp	520	30	4.5	1.5	105,300	3,900	
T.B.T. Approach	460	120	4.5	1.5	372,600	13,800	
T.B.T. Approach	600	40	4.5	1.5	162,000	6,000	
						23,700	CY

Demolish Ramp Columns:

Concrete:

Approx. #Columns	Approx. Ht ft	Approx. Area ft^2	1.5 Bulk	Ft^3	Yd^3	
8	30	25	1.5	9000	333	CY
21	30	25	1.5	23625	875	CY
50	30	4.91	1.5	11047.5	409	CY
					1,618	CY

Demolish Ramp Bent Cap:

Bent cap volume = approx. = 30% column	485	CY

Demolish Ramp Foundation:

Foundation volume assumed to be = approx. same volume as column	1,618	CY

Demolish old Second St. Ramps: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Depth ft	1.5 Bulk 1.5	Ft^3	Yd^3	
	50	30	4.5	1.5	10,125	375	CY

TOTAL RAMP DEMOLITION THIS PAGE =	27,795	CY

ICF KAISER	JOB NO. 65928-005-06
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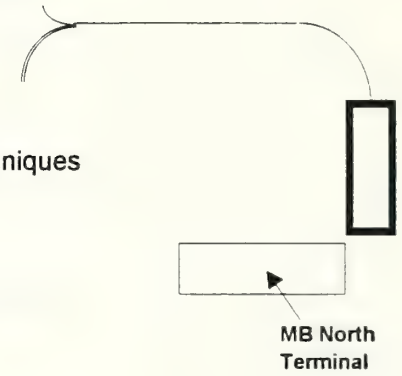
Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.1 (Continued) Demolish Transbay Terminal

Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto.
4. Information from ICF Kaiser TBT Demolition estimate

Trans Bay Terminal Demolition: (See attached ICF KE TBT Demolition Estimate)

CONCRETE DEMOLITION	15,700	CY
STEEL DEMOLITION, OFF-HAUL & SALVAGE	3,600	TONS
ROOFING DEMOLITION & OFF-HAUL	26,000	CY
TRAFFIC CONTROL	1	LS
INTERIOR, MECHANICAL & ELECTRICAL	1	LS

Quantity Summary for Stage 2.1

CONCRETE DEMOLITION	58,979	CY
STEEL DEMOLITION, OFF-HAUL & SALVAGE	3,600	TONS
ROOFING DEMOLITION & OFF-HAUL	26,000	CY
TRAFFIC CONTROL	1	LS
INTERIOR, MECHANICAL & ELECTRICAL	1	LS

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

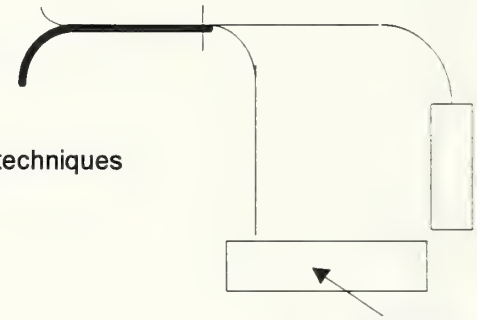
ESTIMATE FOR SECONDARY ALTERNATIVE TRANS BAY TERMINAL MEDIUM

Stage 2.2 Construct East half of new bus ramp parallel to Essex St.

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996

Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto.



New bus ramp (part) parallel. to Essex: (unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	650	32	20,800	
			20,800	ft^2

TOTAL NEW CONCRETE THIS PAGE =	20,800 SF

ICF KAISER	JOB NO. 65928-005-06
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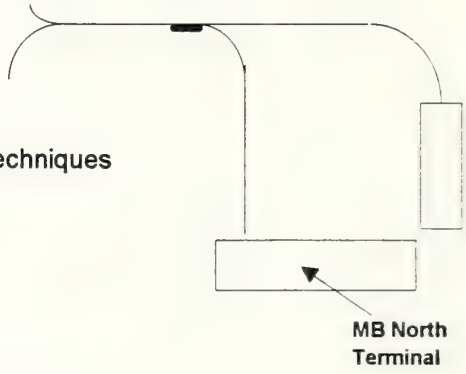
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

Sage 2.2 (Continued) Construct East half of new bus ramp over Folsom Street

Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)

New bus ramp (part) parallel. to Essex over Folsom:
(unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	120	32	3,840	
			3,840	ft^2

TOTAL NEW CONCRETE THIS PAGE =	3,840 SF

ICF KAISER	JOB NO. 65928-005-06
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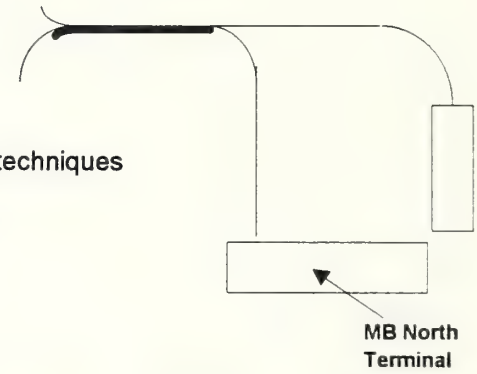
Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.2 (Continued) Construct West Half of New Bus Ramp Parallel to Essex Street

Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information
has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)

New bus ramp (part) West Half parallel. to Essex over Folsom:
(unit cost to be applied $120.00/sf from P.B. estimate)

Concrete:	Length	Width	Area	
	ft	ft	ft^2	
	1100	14	15,400	
			15,400	ft^2

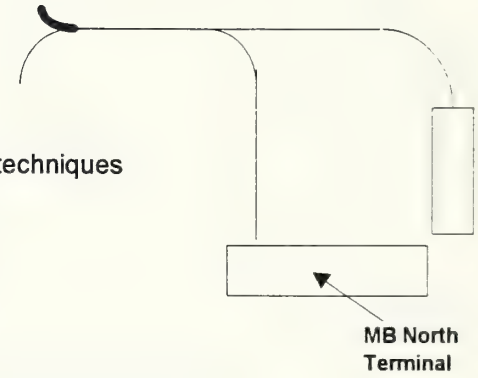
TOTAL NEW CONCRETE THIS PAGE =	15,400 SF

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV. _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY _____ DATE _____

Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.2 (continued) Construct At-Grade Crossing South of Harrison Street, Demolish old 2nd Street Ramp

Note, P.B. Estimate is not clear in defining bus ramp areas. for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)

Construct At-Grade Crossing South of Harrison Street

(unit cost to be applied $7.00/sf from P.B. estimate)

# of segments	Length	Width	Area	
	ft	ft	ft^2	
2	300	22	6,600	
			6,600	ft^2

TOTAL NEW CONCRETE THIS PAGE =	6,600 SF

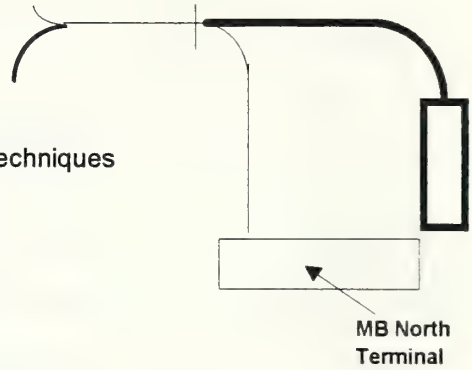
P.B.'s estimate indicates a unit cost of $7.00/sf of at grade paving. However, since said ramps must match aerial ramps at ramp interface increase by $18/sf. **SAY $25/SF**

ICF KAISER	JOB NO. 65928-005-06
CALTRAIN SAN FRANCISCO DOWNTOWN EXTENSION	CALC. NO. _____ REV _____
PROJECT	SHEET _____ OF _____
BUS FACILITIES	DESIGNED BY R. Moore DATE 5-16-96
	CHECKED BY DATE

Stage construction information obtained from "Stage Construction Drawings, #182-186

Stage 2.2 (Continued) Construct New Transbay Terminal and Approuch Ramp

Note, P.B. Estimate is not clear in defining bus ramp areas.
for demolition and construction. Therefore the following information has been estimated per field review performed May 7, 1996



Estimate quantities were based on the following measuring techniques

1. Form work panel lines (assuming 4'X8' plywood panels)
2. Pacing column dimensions.
3. Scaling from 1"=100' scale orthophoto (Sep. 24, 1994)
4. Information from ICF Kaiser TBT Demolition estimate

Construct Ramp Superstructure: (average depth = approx. 4.5' for concrete girders)

Concrete:	Length ft	Width ft	Total ft^2	
	520	30	15,600	
T.B.T. Approach	460	140	64,400	
T.B.T. Approach	600	110	66,000	
	Total		146,000	Per P.B. Estimate, use $120 / SF

TOTAL NEW CONCRETE THIS PAGE = 146,000.00 SF

New Trans Bay Terminal (Medium)

For Backup, See Attachement Sheet

Terminal : (see P.B. estimate for cost breakdown)	$	52,629,191
~~Temporary Bus Terminal=~~	~~$~~	~~2,100,000~~
Plus P.B.'s "Grade level elements " (not shared) =	$	2,795,052
Total MB North Transit Terminal =	$	55,424,243

Quantity Summary for Stage 2.2

Concrete for Ramp Construction = 186,040 SF
Concrete for at Grade Crossing = 6,600 SF
New TB Terminal (Medium) = 1 EA ($62,419,295)

Transbay Medium Summary

Parsons Brinckerhoff Construction Services, Inc.
Project: Transbay Terminal
Client: City of San Francisco
Date: 17-Oct-95

Re: **Transbay - (Option TBT M)**

DESCRIPTION			TOTAL (1995$)
1 Structure			$18,120,111
2 Architectural			$19,616,764
3 Vertical Circulation			$5,645,000
4 Mechanical, Electrical, & Fire Protection			$9,247,315
5 Temporary Bus Terminal			~~$2,100,000~~
6 Grade Level Elements @ 50% (Shared w/JPB)			$2,795,052
SUBTOTAL TRANSBAY - MEDIUM			**$57,524,243**
CONTINGENCY		**25%**	**$14,381,061**
ENGINEERING & ADMINISTRATION		**25%**	**$17,976,326**
PROJECT RESERVE		**8%**	**$7,190,530**
TOTAL TRANSBAY - MEDIUM		**TOTAL**	**$97,072,160**

Possible Additives:
(Following costs include Contingencies, Eng. & Admin., and Project Reserve Costs)

1 Demolition - Existing Bus Ramps		$6,632,930
2 New Bus Ramps		$38,758,500
3 Street and Roadway Modifications		$575,049
4 Demolition - Existing TBT		$7,931,250
5 Foundation - (if CalTrain is not extended under TBT)		$12,463,273
6 Grade Level Elements @ 50% (JPB's Share)		$4,716,650
	TOTAL	**$168,149,811**

Assumptions/Qualifications:

1.) Possible Real Estate Acquisition is *not included*
2.) Seismic Upgrade of existing structures is *not included*
3.) Train Level and foundation costs are *not included*
4.) Temporary Bus Facility *is included*
5.) Minor Street Improvements *are included* (New Folsom Street is not included)
6.) Muni/SamTrans Surface Bus Terminal *is included*
7.) Van Pool Storage *is included*
8.) Tenant finish-out is *not included*
9.) Joint Plaza development of 27,000 sf at main entrance *is included ($2.278m w/markups)*
10.) Minor Hazardous Material disposal *is included*
11.) Engineering & Administration Costs includes Design, Construction Mgt., and Agency Administration Costs

ATTACHMENT 1

Transbay Medium

Parsons Brinckerhoff Construction Services, Inc.
Project: Transbay Terminal
Client: City of San Francisco
Date : 15-Oct-95

Re: Transbay Terminal - (Option TB Medium)

	Description	Qty.	Units	Unit Price	Subtotal	Total (1995$)
	RAMPS					
1	Demolition - Existing Bus Ramps					$3,930,625
	Inbound/Outbound for Buses	47,000	SF	$16.88	$793,125	
	Traffic Off-Ramp	51,000	SF	$12.50	$637,500	
	Inbound Viaduct	130,000	SF	$12.50	$1,625,000	
	Outbound Viaduct	70,000	SF	$12.50	$875,000	
2	New Bus Ramps					$22,968,000
	Bus Off-Ramp Viaduct	21,400	SF	$120.00	$2,568,000	
	Approach Viaduct	170,000	SF	$120.00	$20,400,000	
	Traffic Off-Ramp	38,000	SF	$120.00	by others	
3	Street and Roadway Modifications					$340,770
	A.C. Transit Bus Pavement to Storag	20,110	SF	$7.00	$140,770	
	Traffic Signal Mod. @ 2nd for A.C. T	1	LS	$100,000.00	$100,000	
	Traffic Signal Mod. @ Folsom/	1	LS	$100,000.00	$100,000	
4	Seismic Upgrades	1	LS	NIC	NIC	
5	R.O.W. Take	1	LS	NIC	NIC	
				SUBTOTAL RAMPS		**$27,239,395**
	TRANSBAY TERMINAL					
1	Demolition - Existing TBT	1	LS	NIC		NIC
2	Foundation - TBT	1	LS	NIC		NIC
3	Structural Steel					$13,099,050
	Structural Steel (Wgts. > 40#/LF)	11,055,330	LBS	$1.08	$11,887,243	
	Mtl. Decking 3" - 20ga.	383,180	SF	$3.16	$1,211,807	
4	Lightweight Concrete	6,599	CY	$250.00		$1,649,803
5	6 x 6 - w2.0 x w2.0 Mesh (+10%)	421,498	SF	$0.60		$252,899
6	Waterproofing	383,180	SF	$2.00		$766,360
7	Miscellaneous Metals (Wgts. < 40#/LF)	360,000	LBS	$2.00		$720,000
8	Spandrel Beam Exterior	65,280	SF	$25.00		$1,632,000
9	Architectural (Shared)	1	LS	$16,821,712.25		$16,821,712
10	Vertical Circulation	1	LS	$5,645,000.00		$5,645,000
11	Fire Protection	480,380	SF	$6.00		$2,882,280
12	Plumbing	480,380	SF	$4.00		$1,921,520
13	Ventilation	480,380	SF	$2.75		$1,321,045
14	Electrical	480,380	SF	$6.50		$3,122,470
				SUBTOTAL TRANSBAY TERMINAL		**$49,834,139**
	TEMPORARY BUS TERMINAL					
1	Temporary Bus Terminal	1	LS	$2,100,000.00		$2,100,000
				SUBTOTAL TEMPORARY BUS TERMINAL		**$2,100,000**
				SUBTOTAL RAMPS, TBT, & TEMPORARY BUS (w/o contingency)		**$79,173,534**
				CONTINGENCY	**25%**	**$19,793,383**
				MANAGEMENT ADD-ON ALLOWANCE	**25%**	**$24,741,729**
				PROJECT RESERVE	**8%**	**$9,896,692**
					TOTAL	**$133,605,338**

18,112,112

Segment Composition of Alternatives

ALTERNATIVE ESTIMATES - DEVELOPMENT AND ANALYSIS SYSTEM 2.12 06/09/96
ICF KAISER ENGINEERS - CalTrain Downtown Extension

ALTERNATIVE DESCR.	ALT #	SEG 1	SEG 2	SEG 3	SEG 4	SEG 5	SEG 6	SEG 7	SEG 8
BASE CASE, BUT W/ LONG TUNNEL	1A	1B	2A	3	4	5D	SW1A	SW3B	SW9
BASE CASE, BUT W/ MEDIUM TUNNEL	1B	1B	2B	3	4	5D	SW1A	SW3B	SW9
BASE CASE, BUT W/ OPTION A & 16TH ST YARD	2A	1A	2C	3	4	5D	SW1A	SW3B	SW9
BASE CASE, (OPTION B) BUT W/ TOWNSEND ST YARD	2BT	1B	2C	3	4	5D	SW1A	SW4	SW9
BASE CASE, BUT W/ OPTION C & 16TH ST YARD	2C	1C	2C	3	4	5D	SW1A	SW3B	SW9
BASE CASE, BUT W/ TRANSBAY SHORT BUS TERMINAL	3B	1B	2C	3	4	5B	SW1A	SW3B	SW9
BASE CASE, BUT W/ TRANSBAY MEDIUM BUS TERMINAL	3C	1B	2C	3	4	5C	SW1A	SW3B	SW9
BASE CASE, BUT W/ ELECTRIC POWER TRAILER	5B	1B	2C	3	4	5D	SW1B	SW3B	SW9
BASE CASE, BUT W/ 25KV AC TO GILROY	5C	1B	2C	3	4	5D	SW2	SW3B	SW9
BASE CASE: OPT B, SHORT TNL, NO HIRISE, YDB, DUALM	_BC	1B	2C	3	4	5D	SW1A	SW3B	SW9

‖ F3=Filter‖ F4=Del‖ F5=Go to‖ F6=Copy‖ F7=Pack‖ Esc=‖ F3=Filter‖ F4=Del‖ F5=Go to‖ F6=Copy‖ F7=Pack‖ Esc=EXIT‖

File: LV2_LIST Record: 3/10 File: LV2_LIST Record: 3/10

CALTRAIN DOWNTOWN EXTENSION PROJECT
SAN FRANCISCO, CALIF.
SEGMENT DEFINITION TABLE

SEGMENT DESCRIPTION	SEGMENT NUMBER	STARTING STATION	ENDING STATION	TURNOUTS	ROUTE FEET (RF)	TRACK FEET (TF)
APPROX. BERRY & SEVENTH TO APPROX. THIRD & TOWNSEND VIA AT GRADE, RETAINED CUT AND CUT & COVER. PORTAL ON TOWNSEND BETWEEN FIFTH AND FOURTH.	1A	129+25	169+00	6	3,975'	8,730'
APPROX. BERRY & SEVENTH TO APPROX. THIRD AND TOWNSEND VIA AT GRADE, RETAINED CUT AND CUT & COVER. PORTAL ON TOWNSEND NEAR FOURTH.	1B	129+65	169+00	6	3,935'	8,650'
BETWEEN IRWIN & HOOPER ON SEVENTH TO NEAR THIRD AND TOWNSEND VIA AT GRADE, RETAINED CUT AND CUT & COVER. PORTAL ON SEVENTH BETWEEN BERRY & HOOPER.	1C	121+70 167+00 167+70BK =	167+70 169+00 167+00AH	6	4,800'	10,380'
APPROX. THIRD AND TOWNSEND TO APPROX. BRYANT ST. VIA MINED TUNNEL ON LONG CURVE.	2A	169+00 191+15BK =	191+15 194+75AH	0	2,215'	4,430'
APPROX. THIRD AND TOWNSEND TO APPROX. BRYANT ST. VIA MINED TUNNEL ON MEDIUM CURVE.	2B	169+00 188+30 186+55BK =	186+55 194+75 188+30AH	0	2,400'	4,800'
APPROX. THIRD AND TOWNSEND TO APPROX. BRYANT ST. VIA MINED TUNNEL ON SHORT CURVE.	2C	169+00	194+75	0	2,575'	5,150'
APPROX. BRYANT ST. TO BETWEEN FOLSOM AND CLEMENTINA VIA MINED TUNNEL.	3	194+75	208+00	0	1,325'	2,650'
BETWEEN FOLSOM AND CLEMENTINA TO BETWEEN MINNA AND NATOMA WEST OF FIRST ST. VIA CUT & COVER.	4	208+00 CENTERLINE	217+90 CENTERLINE	8	990'	5,260'

CALTRAIN DOWNTOWN EXTENSION PROJECT
SAN FRANCISCO, CALIF.
SEGMENT DEFINITION TABLE

SEGMENT DESCRIPTION	SEGMENT NUMBER	STARTING STATION	ENDING STATION	TURNOUTS	ROUTE FEET (RF)	TRACK FEET (TF)
TRANSBAY TERMINAL SUBWAY STA. BETWEEN MINNA AND NATOMA WEST OF FIRST TO BEALE ST. (HIGH RISE)	5A	217+90	*228+25	0	1,035'	5,130'
TRANSBAY TERMINAL SUBWAY STA. BETWEEN MINNA AND NATOMA WEST OF FIRST TO BEALE ST. (BUS TERMINAL - TRANSBAY SHORT)	5B	217+90	*228+25	0	1,035'	5,130'
TRANSBAY TERMINAL SUBWAY STA. BETWEEN MINNA AND NATOMA WEST OF FIRST TO BEALE ST. (BUS TERMINAL - TRANSBAY MEDIUM)	5C	217+90	*228+25	0	1,035'	5,130'
16TH ST. AND OWENS ST. STORAGE YARD (OPTION A)	SW3A	N/A	N/A	16	N/A	14,775'
16TH ST. AND OWENS ST. STORAGE YARD (OPTION B)	SW3B	N/A	N/A	19	N/A	16,210'
16TH ST. AND OWENS ST. STORAGE YARD (OPTION C)	SW3C	N/A	N/A	11	N/A	12,130'
TOWNSEND ST. STORAGE YARD	SW4	N/A	N/A	17	N/A	19,010'

* - BASED ON LIMIT OF EXCAVATION

CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE

SEG.	TRACKWAY DESCRIPTION	START	END	ALIGNMENT (RF) STATION	BAY BRG. ANCHORAGE	AERIAL	AT GRD.	RET. CT. #256	C&C (S.C.) #243	C&C (BOLT) #244	C&C (SPTC) #245	C&C (SPTC) #246	C&C (SPTC) #247	MINED TUNNEL #251	SHORING WALL HEIGHT (ft) Estimate	SHORING WALL HEIGHT (ft) Site Specific
#1A	Approx. Berry and Seventh to approx. Third and Townsend.	129+25	169+00													
	AT GRADE, Approx. Berry and Seventh to approx. Fifth and Townsend.	129+25	152+75				2,350'									
	RETAINED CUT, Approx. Fifth and Townsend to between Fourth & Fifth on Townsend.	152+75	159+35					660'								
	CUT & COVER from between Fourth and Fifth on Townsend to approx. Third and Townsend.	159+35	169+00						965'							
	TOTAL SEGMENT		3,975'				2,350'	660'	965'							
#1B	Approx. Berry and Seventh to approx. Third and Townsend.	129+65	169+00													
	AT GRADE, Approx. Berry and Seventh to approx. Fifth and Townsend.	129+65	152+75				2,310'									
	RETAINED CUT, Approx. Fifth and Townsend to between Fourth and Fifth on Townsend.	152+75	159+35					660'								
	CUT & COVER from between Fourth and Fifth on Townsend. to approx.Third and Townsend.	159+35	169+00						965'							
	TOTAL SEGMENT		3,935'				2,310'	660'	965'							
#1C	Between Irwin and Hooper on Seventh to Third and Townsend	121+70	169+00													
	STA 167+70 BK = 167+00 AH															
	AT GRADE, Between Irwin and Hooper on Seventh to Hooper and Seventh.	121+70	123+40				170'									
	RETAINED CUT, Hooper and Seventh to between Berry and Hooper on Seventh	123+40	130+40					700'								
	CUT AND COVER, Between Berry and Hooper on Seventh to approx Third and Townsend	130+40	169+00						3,950'							
	TOTAL SEGMENT		4,800'				170'	700'	3,950'							

CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE

SEG.	TRACKWAY DESCRIPTION	START	END	ALIGNMENT (RF) STATION	BAY BRG. ANCHORAGE	AERIAL	AT GRD.	RET. CT. #256	C&C (S.C.) #243	C&C (BOLT) #244	C&C (SPTC) #245	C&C (SPTC) #246	C&C (SPTC) #247	MINED TUNNEL #251	SHORING WALL HEIGHT (ft) Estimate	Site Specific
#2A	Approx. Third and Townsend to approx. Bryant St. (Long Curve)	169+00	191+15													
	STA 191+15BK = 194+75AH															
	MINED TUNNEL	169+00	191+15											2,215'		
	TOTAL SEGMENT		2,215'											2,215'		
#2B	Approx. Third and Townsend to approx. Bryant St. (Medium Curve)	169+00	194+75													
	STA 186+55 BK = 188+30 AH															
	MINED TUNNEL	169+00	194+75											2,400'		
	TOTAL SEGMENT		2,400'											2,400'		
#2C	Approx. Third and Townsend to approx. Bryant St. (Short Curve)	169+00	194+75													
	MINED TUNNEL	169+00	194+75											2,575'		
	TOTAL SEGMENT		2,575'											2,575'		
#3	Approx. Bryant St. to between Folsom and Clementia.	194+75	208+00													
	MINED TUNNEL	194+75	208+00											1,325'		
	TOTAL SEGMENT		1,325'											1,325'		
#4	Between Folsom and Clementia to between Minna and Natoma west of First St. (High Rise)	208+00	217+90													
	STATIONING IS ON CENTERLINE.															
	CUT & COVER	208+00	217+90						990'							
	TOTAL SEGMENT		990'						990'							

CALTRAIN DOWNTOWN EXTENSION
SAN FRANCISCO, CALIF.
ALIGNMENT SCHEDULE

SEG.	TRACKWAY DESCRIPTION	START	END	ALIGNMENT (RF) STATION	BAY BRG. ANCHOR-AGE	AERIAL	AT GRD.	RET. CT. #256	C&C (S.C.) #243	C&C (BOLT) #244	C&C (SPTC) #245	C&C (SPTC) #246	C&C (SPTC) #247	MINED TUNNEL #251	SHORING WALL HEIGHT (ft) Estimate	Site Specific
#5A	Transbay Terminal Subway Sta. between Minna and Natoma west of First to Beale St. (High Rise)	217+90	228+25 *226+45	1,035'												
	SHORED EXCAVATION	217+90	228+25	1,035'												
	TOTAL SEGMENT		1,035'	1,035'												
#5B	Transbay Terminal Subway Sta. between Minna and Natoma west of First to Beale St. (Bus Terminal - Transbay Short)	217+90	228+25 *226+45	1,035'												
	SHORED EXCAVATION	217+90	228+25	1,035'												
	TOTAL SEGMENT		1,035'	1,035'												
#5C	Transbay Terminal Subway Sta. between Minna and Natoma west of First to Beale St. (Bus Terminial - Transbay Med.)	217+90	228+25 *226+45	1,035'												
	SHORED EXCAVATION		228+25	1,035'												
	TOTAL SEGMENT		1,035'	1,035'												

* - END OF TRACK

CALTRAIN S.F. DOWNTOWN EXTENSION

CAPITAL COST ESTIMATE METHODOLOGY DESCRIPTION

To estimate the capital costs for required utility relocation/reinforcement, the following methods were used.

1. Identify the types and sizes of existing underground utilities within the project area. Calculate the length or number of existing utility facilities, classified as parallel to or crossing the proposed alignment, and tabulate each by alignment segment.

2. Classify affected utilities as to disposition; relocate, leave-in-place, support-in-place, etc.

3. Assign unit cost values based on input from utility companies, responsible agencies or departments, and historic cost data records.

4. Tabulate estimated costs within each alignment segment organized by utility system.

5. Compute the total estimated utility cost for each alignment segment.

Alternative 3A-K

The tunnels are of cut & cover and mined type. The two single-track tunnels are separated by walls, following the "King Street Alignment" (To be defined). CalTrain Terminal is above ground.

The final proposed alignment is ALT 3B-T, as described below:

Caltrain Terminal below ground in the basement of a brand new Transbay Terminal constructed on the site of the existing terminal: new bus terminal on the second and third levels above ground floor mezzanine: cut-and-cover and mined tunnel alignment starting at 4th Street and following, Colin P. Kelly and Essex streets.

The alignment profile for this alternative shows that the steepest grade is **2.7%.** At the time of writing the memo, no detailed tunnel cross-sections and partition wall information were available. It is assumed that the tunnel will consist of single-track tunnel sections, double-track tunnel sections without partition walls and double-track tunnel sections with partition walls.

OVERVIEW OF DESIGN CRITERIA

To maintain an acceptable environment in the subway, ventilation systems should be able to control air quality, temperature and velocity in the station and tunnels within acceptable ranges.

In normal subway systems, the maximum ventilation load requirements will occur during fire emergency when large airflow is needed to control and move the smoke and hot gases away from the evacuating patrons and to maintain the temperature in the egress under a certain level.

Criteria for Emergency Operation

Emergency conditions, in general, result from a malfunction of the transit vehicle. The most serious emergency condition is a stopped train on fire in a tunnel, disrupting traffic and requiring passenger evacuation. The ventilation system must be capable of maintaining a safe evacuation path from the train that is clear of smoke and hot gases.

Tunnels

For tunnel fires, sufficient mechanical ventilation must be provided to move smoke in one direction or the other, as required, to maintain acceptable conditions along a single evacuation route from one side of the fire. Acceptable conditions are defined as follows:

- The maximum temperature in the evacuation route shall be 140 degrees F or less, ignoring radiant heating

- The minimum air velocity in the evacuation path shall not be less than that known as the *Critical Velocity* required to control the spread of smoke and hot gases from the fire into the evacuation path. The critical velocity is a site-specific value based on the tunnel geometry, the heat release rate, the psychrometric conditions of the ventilating air, and the tunnel grade at the location of the fire.

- The maximum air velocity along the passenger egress route should be less than 2000 fpm.

Stations

For station fires the ventilation system should provide uncontaminated air along all station entrances and emergency exits for egress. The maximum air temperature in the evacuation route should be less than 140 degrees F, ignoring radiant heating.

Criteria for Normal Operation

The operation is considered 'normal' when trains are moving through the system according to schedule and when passengers are traveling smoothly through the station to and from transit vehicles. Since this is the predominant mode of operations, considerable effort is required to assess the impacts of train movement on the station environment and determine the requirements of the Station Environmental Control System (ECS).

The patrons should not be exposed to excessive temperature and air velocities while accessing the station platform, waiting or exiting. Current NFPA 130 and SEDH recommend a maximum air velocity not greater than 1000 feet per minute. And an average of 700 fpm is desirable. As for the temperature, while there are no firm criteria, a maximum 9 degrees F (5° C) above the ambient temperature is recommended.

Criteria for Natural Ventilation System

The ventilation system should be able to provide at least four air changes per hour. The fan discharge velocity is not to exceed 1000 fpm at street level, or 500 fpm on sidewalk.

For more design criteria related to subway environment and other issues, please refer to "*Caltrain San Francisco Downtown Extension Ventilation Study Report* ", "*Design Criteria for Station and Tunnel Ventilation*" prepared by ICF Kaiser Engineers, Inc. and SEDH.

ANALYSIS AND RESULTS

Due to budget limitations, no SES simulations were performed for ALT 3B-T. The ventilation system is suggested based on the previous Subway Environment Simulation

(SES) computer modeling of ALT 2A-T, 2B-T, 3A-K, and on the airflow calculated to provide the critical air velocity at the worst-case location of this alignment.

ALT 2A-T and ALT 2B-T were more complicated in terms of station and tunnel constructions. They both have a three-stack station and tunnels splitting and staggered which increased the difficulties of emergency ventilation. In ALT-3B, the station has one level, and contains six tracks. The tunnel sections consist of single-track tunnel sections, double-track tunnel sections without partition walls and double-track tunnel sections with partition walls, but not staggered. The station is more open comparing to ALT 2A-T and ALT 2B-T, and there are less restrictions to the airflow through the stairways. In this situation, the station fans will be less effective in ventilating a tunnel fire.

With the assumption of an airflow splitting by one to three (one from or to the incident train, three from or to the uncontaminated side), we estimated that 1000 kcfm total fan capacity will be needed for a train fire(at grade 2.7%) in a two-track tunnel without partition wall.

In order to incorporate in the SFFD's requests, a partition wall has been assumed separating the tunnels. For a train fire in a single-track tunnel or a two-track tunnel with partition walls (at grade 2.7%), the airflow required to achieve the critical velocity is 160 kcfm. This requires a fan capacity about 600 kcfm. If the tunnel fan has a capacity of 400 kcfm, the other 200 kcfm should be contributed by the station fans. Assuming a one to three airflow splitting rate at the two-to-one tunnel interface, it requires the total capacity of the station fans to be 800 kcfm.

This estimation may be conservative. It is recommended that in the detailed design stage, the SES simulations be conducted with more detailed tunnel and station information.

The ventilation system should also be able to provide at least four air changes per hour, This will need passive vent shafts to connect to the trackways, spaced about 1000 ft apart, and two shafts of 200 ft^2 at each location.

In the station, the train piston effect will move airflow up and down the stairways. The arriving and departing trains will also mix the air in the station with the air in the tunnel. With the passive shafts built along the tunnel as suggested above, no extra vent shafts are needed in the station.

CONCLUSIONS AND RECOMMENDATIONS

- Three fan rooms each housing a total capacity of 400 kcfm fans are estimated as needed in this alternative: one at each end of the station, one in the tunnel section (at about mid-tunnel).

- At least in one of the station fan room, fans should be equipped with sound attenuators, and be able to operate in multi-speed for normal and emergency conditions

- Passive vent shafts are needed to connect to the trackways, spaced about 1000 ft apart, and two shafts of 200 ft^2 at each location between the station and the portal

- The fan and vent shaft discharge velocity is not to exceed 1000 fpm at street level, or 500 fpm on sidewalks. Gratings should be designed accordingly. No stacks are needed if above discharge velocity limit is not exceeded.

Detailed simulations and analysis are suggested when more design information is available or in the detailed design stage.